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ABSTRACT

Improvement of primary school education in Indonesia has been sought since a national standardized curriculum was established in 1976. Curriculum reform centered on requirements for teaching and learning materials, libraries and library books, and other learning equipment. School management and teacher performance have also been emphasized. The need to improve the quality of primary education was reaffirmed in 1986 and is included in the Fifth Five-Year Development Plan. The aim of this study was to produce information and policy recommendations on how to improve primary schools. This study examined communities and schools to estimate primary school attendance, identify factors that influence participation, measure sixth-grade achievement, gauge the progress in different provinces, rank schools by achievement, and identify factors responsible for differential achievement in schools. Four major research questions were posed in this study: (1) What is the quality of Indonesian basic education? (2) What causes educational differences within the country? (3) How is the primary school system responsible for test results? and (4) What factors influence school quality? In addition to an introduction, this study includes chapters on problems and issues in primary education, disparity in academic achievement, school quality and academic achievement, and conclusions and recommendations. An appendix contains a list of variables used in the analysis. (Contains 30 references.) (JPT)

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EPP

EDUCATIONAL POLICY AND PLANNING PROJECT

A GOVERNMENT OF INDONESIA - USAID PROJECT

Improving the Educational Quality of Primary Schools

Ace Suryadi

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EPP

EDUCATIONAL POLICY AND PLANNING PROJECT

A GOVERNMENT OF INDONESIA - USAID PROJECT

Improving the Educational Quality of Primary Schools

Assessment of School Quality and Students' Achievement in Indonesian Primary Schools

Ace Suryadi

Pusat Informatika | Center for Informatics
Balitbang Dikbud | Office of Educational and Cultural Research and Development

DEPARTMEN PENDIDIKAN DAN KEBUDAYAAN | MINISTRY OF EDUCATION AND CULTURE

Jakarta, Indonesia

PREFACE

The Educational Policy and Planning (EPP) Project is a seven year project conducted jointly by the Indonesia Ministry of Education (MOEC) and the United States Agency for International Development (USAID). The overall project objective is to improve the quality of education in Indonesia by assisting the MOEC, through the Office of Educational and Cultural Research and Development (Balitbang Dikbud), to formulate better policies and long-term plans. The project aims to improve policy formulation and long-term planning by improving the timeliness, relevance and accuracy of educational data collection, the subsequent analyses of such data, and their ultimate use for policy and decisionmaking.

There are three major components of the EPP Project: (1) development of an integrated management information system (MIS) within the MOEC, (2) enhancement of MOEC policy research and analysis capacity, and (3) support for MOEC institutional development at the national and provincial level through training and technical assistance. EPP technical advisory staff work closely with counterpart Indonesian staff as part of a collaborative process of developing institutional capacity.

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Republic of Indonesia

The EPP Project in collaboration with the USAID Improving the Efficiency of Educational Systems (IEES) Project, publishes EPP documents in order to disseminate this knowledge and extend its usefulness. EPP has carried out a series of policy studies designed to provide answers to key questions facing Indonesian educators. These include:

The Quality of Basic Education
The Quality and Efficiency of Vocational/Technical Education
The Strengthening of Local Education Capacity
Developing Indicators of Educational Efficiency
Teacher Education Issues
Curriculum Reform and Textbook Production
Education, Economic, and Social Development

This series has been planned under the direction of Moegiadi, Balitbang Dikbud, and Boediono, Center for Informatics, Balitbang Dikbud and Simon Ju, EPP Chief of Party.

Editors for the series are Abas Gozali, Reta Hendrati Dewi, Center for Informatics, and Jerry Messec, IEES, Florida State University.

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CHAPTER I

INTRODUCTION

1. Background of the Problem

Activities targeted toward the improvement of primary school quality have been emphasized since 1976 when the standardized national 1975 curriculum was first introduced throughout the school system. The curriculum reform largely influenced changes in the provision of teaching and learning materials required by the school system, namely textbooks, libraries and library books, and many types of learning equipment. Attempts to improve the quality of school management and teacher performance have also been undertaken in recent years.

The comprehensive Indonesian Education Sector Review, conducted in 1986 by Balitbang Dikbud in collaboration with the USAID Improving the Efficiency of Educational Systems (IEES) project, reemphasized the need to further improve the quality of primary education. As a result of the recommendations made in the sector review, the study of the Quality of Basic Education became one of the major policy research agendas of the Educational Policy and Planning (EPP) Project within the Office of Educational and Cultural Research and Development (Balitbang Dikbud).

The need to improve the quality of primary education was first identified at the time when the opportunity for basic education had been virtually achieved in Indonesia. The net enrollment ratio of 7-12 year-old children reached more than 98% by the early stages of the Fifth Five-Year Development Plan (Repelita V). As policy concerns have gradually turned from quantity to quality, so has the improvement of quality became a major task. In fact, quality issues have been given top priority in Repelita V.

In the meantime, the instability of world oil prices and production since the early 1980s has impacted severely the Government of Indonesia's fiscal capacity. Funding to the developmental sectors, including education,has declined considerably since 1985. The reduction in public budgetary support for the education sector has given impetus to government's endeavors to achieve the highest level of efficiency in resource allocation for educational development.

Under such difficult economic circumstances, the policy focus on quality improvement within the education system has been considered even more important. It is believed that the higher the quality of the

education system, the more likely it is that it will produce "the quality of Indonesian man" dictated by the Guidelines of State Policy (GBHN, 1988-1992). Thus, efforts to improve the quality of the education system are among the most imperative tasks in the national development program, especially in the context of improving the quality of human resources development.

However, improving the quality of the school system is not a simple task. Education is a multi-output process, characterized by multiple goals, and operated under the influences of an unlimited number of inputs. A successful educational institution cannot, therefore, be identified only by its capability to achieve a single objective.

In contrast, current approaches to improving educational quality have concentrated too much on the enhancement of the single knowledge base concept of output. The educational process had been characterized only by imparting theoretical knowledge to students. While this is certainly important, mastery of knowledge alone does not appear to be adequate to prepare school graduates to face the complexity of societal problems. The conception of educational quality in such terms is too conservative and narrow, since the goals of education are neither independent nor disjointed from the actual goals of society.

The issue of educational quality is of critical concern to the Government of Indonesia, and it will continue to be a pressing problem which calls for appropriate actions.

Hence, new ideas and approaches for the improvement of the quality of education need to be generated through policy studies. Dialogue needs to be continued among educators and communities in order to reach agreement on a useful definition of educational quality. The current status and variations of quality in Indonesian primary education needs to be examined, along with the determinants of educational quality and related information that will assist in the development of educational policy.

2. Objectives

The major aim of this study is to produce information and generate policy recommendations in line with the government's policy for the improvement of the quality of primary schools as stated in the Basic Guidelines of State Policy (GBHN,1988). These mid-term policy statements are the bases for generating operational policies needed by all levels of educational management to phase in a systematic approach to improving school quality. Therefore, this study is intended to assist policy makers and planners as input to developing appropriate mid-term policy strategies. This study also is intended to help concerned policy makers generate operational policies for the implementation of the primary educational

quality improvement programs. This study will also attempt to generate preliminary ideas for developing the long-term 25-year plan for the education sector through establishing baseline data and evaluating the current status of the Indonesian primary education system.

This study is composed of two separate but related parts, the *Community Study* and the *School Study*. The specific aim of the *Community Study* was to estimate the participation rates in the different forms of primary school and to identify community factors associated with participation. At the same time, sixth grade academic achievement was measured and factors associated with differential achievement were identified. The overall aims of the *School Study* were to:

(1) measure the status and variation of achievement in each of the three study provinces;

(2) calculate the rank order of schools by achievement after the effects of the socio-economic backgrounds of students have been taken into account; and

(3) identify factors associated with differential achievement at the school level.

3. Research Questions

Four major research questions were investigated in this study.

The questions are as follows:

(1) How can the quality of basic education in Indonesia currently be described? What dimensions of educational quality are to be measured? What relevant problems and issues are to be addressed in the Indonesian Basic Education Quality Study? These questions are concerned with analyzing the current status, variation, and change of the measured school quality variables.

(2) What appear to be the most significant factors in making education differ in quality across Indonesia? This question is concerned with identifying the most important random effect variables that determine differences in school quality.

(3) To what extent does the primary school system explain differences in the quality of output measured in terms of academic testing? To what extent have the involved policy variables made real differences in students academic test scores compared to the home and societal variables? This information is needed for generating ideas and interpretations for dealing with the easily-manipulated school variables.

(4) What school variables have strongly affected or made real differences in school quality? This question attempts to discover school variables which will explain significant amounts of variance in academic testing when important family and community variables are held constant in the analysis.

4. Conceptual Framework

This study at its inception sought to define the quality of basic education through many discussions with multidisciplinary experts in Indonesia. The resulting conception of educational quality has been used in the analytical processes throughout this study. Quality was defined as educational processes which establish in students the capacity for life-long learning. The quality of basic education should then be the effective creation of the "capacity for learning" in individuals participating in primary institutions, both in-school and out-of-school.

The primary school system is perhaps the most important basic education institution. Therefore, its quality is an important concern for educators in order to lay a strong foundation for the further learning capacity of primary graduates. The primary system can be defined as high in quality if it generates this capacity for learning. The learning capacity is determined both by how much students have learned and also by how they have been involved in learning through the instructional process in the school system.

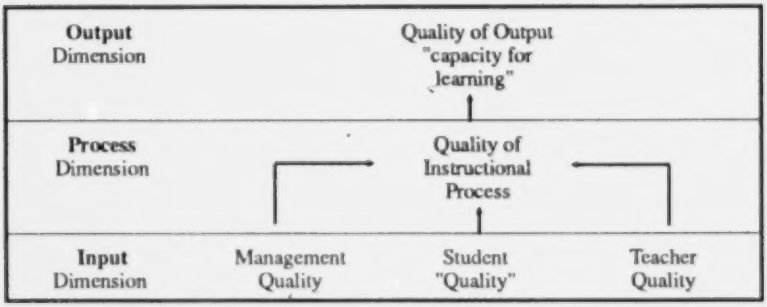
This assumes that the more students are encouraged to learn through active participation, the greater their chances will be to acquire the capacity to learn, and the greater their possibility for successful life-long learning.

The above rationale has led us to further define the quality of basic education as "the capability of the primary school system, both professionally and managerially, to establish the most efficient learning support system in order to achieve the highest possible level of student achievement". Based on this conception, this study examines three major dimensions of the quality of the primary school system as shown in Figure 1.1

This model assumes that primary school quality operates across three dimensions. These are quality of input, quality of instructional process, and quality of output. Quality of input consists of managerial inputs, students, and teachers. The combination of these three factors is taken as an indirect means of measuring instructional quality.

Figure 1.1

Dimensions of Primary School Quality
(A Conceptual Frame of Reference)



a. Quality of Outputs

The output measure of school quality used for this research was individual achievement test scores in Mathematics, Science and Bahasa Indonesia. The achievement test scores were measured by a national standardized achievement test. Quality was indicated by comparison of individual test scores on a norm-referenced measure with the national average level of achievement and variation among the individual scores.

b. Quality of the Instructional Process

Three determinants of output are used in this model which are derived primarily from the working definition of school quality stated earlier. In order for the school system to generate high quality output, it must be associated with the high capacity of the school learning system, as indicated by the quality of instructional process. In this model, the instructional process is viewed as a "black box" and the quality of instruction is proxied in terms of the quality of inputs described above. No direct measure of instructional quality is generated in this study. Instead, school inputs are taken as proxy estimates of instructional quality. This is based upon the assumption that the higher the quality of school inputs is, the higher the instructional quality and the higher the quality of outputs will be. In this model, it is assumed that the quality of school management and teacher input determines the quality of instruction and that this in turn determines the quality of school outputs.

c. Quality of Inputs

Teacher Quality. Teacher quality is composed of three main factors: professional capacity, effort, and time (Levin, 1980). First, teacher capacity is usually characterized by intelligence, attitude, and achievement. In this study, teacher capacity is proxied by test scores in Mathematics, Science, and Bahasa Indonesia.

Teacher effort is defined as how a teacher transfers this capacity into action. In many studies, teacher effort is indicated by teaching activities, relationships with parents, and use of teaching materials. Third, teacher time indicates the length of time a teacher devotes to instructional tasks. Associated with this, the concept of Time on Task (TOT), measured in individual student learning, has been found to be one of the best predictors of school learning.

Management Quality. The quality of school management is determined by managerial inputs and managerial process variables. The managerial inputs, according to the literature, consists of materials, personnel, money, and time. A number of managerial inputs are measured in this study: school plants, instructional facilities, classroom equipment, characteristics of school principals, school expenditures allocated to instruction, and other measures of time. On the other hand, the managerial process is basically the process of utilizing managerial inputs in supporting the process of instruction which in turn determines the level of school outputs.

Student Quality. The "quality" of students is composed of individual student characteristics. The characteristics commonly employed in many studies include the physical, educational and aspirational characteristics of individuals. Other important student characteristic variables, potentially useful for estimating student quality, were not assessed in this study; for example, intelligence (intellectual capacity). The variables involved in the analysis, therefore, indicate"characteristics" rather than measures of the "quality" of students.

Environmental Quality. A number of variables were measured in this study that indicate characteristics of community and family. These have been found in past research to be strongly related to academic achievement. The variables considered in the analysis are school geographical location, societal level of development and family socio-economic status.

In past research, the geographical location of a school system has appeared to be a critical factor in explaining how schools differ. Albeit important, there is not a precise measure of geographical location since the range of school locations is geographically infinite. A simplified measure of school geographical location often used in studies is the

dichotomized "urban" versus "rural" characteristic that is assumed to affect differences in school quality. However, geographical location appears to be a proxy of many different measures of values and characteristics that may not be easily identified, but which are nevertheless influential to school learning and achievement. In that case, geographical location may have to be controlled in the analysis.

Societal level of development is derived from findings that school systems tend to operate differently due to the differences in the level of development of the surrounding society. Societal level of development is a construct usually measured in terms of demographic characteristics, public facilities, economic, education, communication, and transportation infrastructures. It is generally assumed that the more developed a society is, the more likely it is that it can support the operation of a quality school system.

The socio-economic status (SES) of students' families has also been found in many studies to be consistently related to academic achievement. SES has been shown to affect student achievement, an effect that is strongest in more developed societies. In many school achievement studies, SES is measured by housing conditions, family income, parental education and occupational status, and possession of modern household goods.

5. Methodology

There are five methodological issues to be described here; i.e., approach; sampling design; data analysis, prediction, and measurement; and development of an archive system.

a. Approach

This study is essentially a Cross-Sectional Survey in which data were collected from a number of sources at one point in time. The survey comprises of two separate, but related studies, i.e., *the Community Study* and the *School Study*. The first study focused on census block communities and participation rates in primary school. The second study focused on school achievement in grade 6 in the subjects of Bahasa Indonesia, Mathematics, and Science.

Both studies were conducted in the provinces of West Java (Jawa Barat), South Sulawesi (Sulawesi Selatan), and West Nusa Tenggara (Nusa Tenggara Barat) only. These provinces were selected by the Office of Educational and Cultural Research and Development (Balitbang Dikbud) of the Ministry of Education and Culture. Results presented in this report are for these three provinces and can also be applied to other provinces with similar characteristics. For example, West Java is a

densely populated area with some large towns, South Sulawesi may be considered to be semi-rural, and West Nusa Tenggara is rural (see Figures for 1986, Central Bureau of Statistics, Jakarta, 1987).

The total population of Indonesia in 1987, when the data were collected, was estimated to be 171 million. West Java contained 19 percent of the total population, South Sulawesi 3 percent, and West Nusa Tenggara (NTB) 1.5 percent.

b. Sampling Method

Probability sampling was undertaken for both studies.

The Community Study. Within each province, census blocks were stratified according to districts, sub-districts and villages. A stratified systematic sample of census blocks was then drawn within each province. Finally, within each census block, a random sample of 5 Sixth Grade students was drawn (see Postlethwaite and Ross, 1987, and Ross, 1988). The designed and achieved samples are given in Table 1.1.

Table 1.1

Designed and Achieved Samples: Community Study

	Designed		Achieved	
Province	N of Census Blocks	N of Students	N of Census Blocks	N of Students
West Jawa	134	770	133	630
South Sulawesi	134	770	130	602
West Nusa Tenggara	134	770	130	629
3 Provinces	402	2310	393	1861

The School Study. Villages were stratified according to district and sub-district. A number of 134 census blocks were selected for each area, with a probability proportional to size. It should be noted that a census block is a non-administrative unit of a society with an average of 70 to 100 households. These census blocks were created in 1983 when the Agricultural Census was undertaken throughout Indonesia. Within each

census block, one primary school was selected, i.e., the school to which most of the school age children from the selected census block went. The selection of the school sample thus was not random by itself, but was under the framework of selected census blocks. Within each selected school, 15 students were selected. Table 1.2 presents the designed and achieved samples.

Table 1.2

Designed and Achieved Samples: School Study

	Designed		Achieved	
Province	N of Census Blocks	N of Students	N of Census Blocks	N of Students
West Jawa	134	2010	133	1962
South Sulawesi	134	2010	130	1820
West Nusa Tenggara	134	2010	130	1907
3 Provinces	402	6030	393	5689

The total number of respondents to each questionnaire is presented in Table 1.3. The census and school samples also were mapped. Each map indicated where the census blocks and the selected schools were located.

c. Data Analysis

As indicated in the discussion of the theoretical conception of educational quality, the primary school system consists of input and output dimensions of schooling. On the one hand, the output dimension is the primary concern of this study since the measure of output was the major frame of reference of the data analysis. This is indicated by the individual academic achievement scores in Bahasa Indonesia, Mathematics, and Science. The achievement test score in Mathematics is formed by the composition of four different sub-scores, i.e., sets concept, arithmetic, geometry/trigonometry, and algorithmics. The Science score consists of three different sub-scores, i.e., biology, chemistry, and physics. Each of these sub-dimensions of Mathematics and Science scores represents a learning taxonomy as measured by a number of test items. There are no sub-scores for the Bahasa Indonesia test.

Table 1.3

Total Number of Respondents to Each Instrument

	West Java	S. Sulawesi	NTB
Community Study			
Community Questionnaire	133	130	130
Participation Questionnaire	133	130	130
Student Questionnaire	630	602	629
Bahasa Indonesia Test	630	602	629
Mathematics Test	630	602	629
Science test	630	602	629
School Study			
Family Questionnaire	1963	1781	1892
School Administrator	133	131	134
School Principal	133	131	134
Sixth Grade Teacher	133	131	134
Student Questionnaire	1962	1820	1907
Bahasa Indonesia Test	1971	1853	1909
Mathematics Test	1971	1853	1909
Science Test	1971	1853	1909

The achievement tests used by this study were developed by the team members of the study in collaboration with the senior staff members of the Center for Examination of Balitbang Dikbud. The test items were written by designated primary school teachers and were piloted in several randomly selected schools prior to data collection. Subsequently, item analyses were performed to produce the final version of the tests: the 49-item Mathematics achievement test, the 47-item Science test, and the 47-item Bahasa Indonesia test.

Data analyses employed in this study consisted of two models, i.e., descriptive and analytical models. The descriptive model was undertaken for analyzing levels of variations of school quality variables measured throughout this study. The next two chapters report the results of employing univariate and bivariate analyses.

In Chapter II, tables present the resulting analysis of problems and issues dealing with basic education. First, data analysis was concerned with problems related to primary education, such as school access, equity and equality of opportunity, and the internal efficiency of the school system. Second, the data analysis was also concerned with important issues of quality improvement. Both types of analyses were undertaken through use of univariate statistics.

In Chapter III, techniques of bivariate statistics were employed to analyze the disparity in average test scores which existed among several sub-populations. Through use of this technique, average academic scores were compared among differential sub-samples due to structural as well as process variables.

Finally, in Chapters IV and V several analytical models were used to identify determinants of student learning. Four different, but related, models were explored throughout the data analyses to reach important findings. These models are: the *Preliminary Model* that explores a number of variables (malleable as well as non-malleable) strongly associated with student learning; the *Full Model*, an extended version of the preliminary model, involving a larger number of important policy and random-effect variables in the regression equation; and the *Comparison Model*, which replicates the same model in each of the sub-samples, i.e., among provinces, and between rural-urban groups of students. These models are further discussed below.

THE PRELIMINARY MODEL. The model was developed by splitting the variables into two groups; non-malleable (non-policy) and malleable (policy variables). The non-malleable variables were entered into the regression first and the malleable variables second.

$$Y = f(W_i \text{ and } X_i)$$

Where Y is an output measured, W_i represents the individual non-malleable variables, and X_i is the individual malleable variables.

This model was designated "preliminary" because it was aimed at exploring the strongest factors in the output measures. The non-malleable variables were: age of student, sex of student, total household expenditures, urban-rural location of school, condition of house, parent occupation, father's education, family income, and total possessions of modern household goods. The malleable variables were: lighting, lan-

guage used in home, school size, school facilities teacher test scores in Mathematics, Science or Bahasa Indonesia, instructional time in Mathematics, Science, or Bahasa Indonesia, kindergarten attendance, absence from school, language of instruction, teacher having other jobs, years of teaching experience, number of days teacher absence due to sickness, teacher perception of difficulty of teaching all three subjects, teacher guide book available in Mathematics, Science or Bahasa Indonesia, and use of textbooks by students in Mathematics, Science, or Bahasa Indonesia.

THE FULL MODEL. This is an extension of the preliminary model. The "full" model was developed in two ways. First, variables found to be strongly associated with academic achievement were included, and second, some additional process variables were involved to enrich the model. It is assumed that student achievement is a function of educational quality that may exist in a school classroom or in other out-of-school situations, such as in the home, community, or through peer influences. This model does not take into account the typology of variables. The included variables are those which were strongly associated with academic achievement.

The analytical model used in this study was influenced by an important perspective in behavioral research, the "input-output" model. This model assumes that educational output is produced by a combination of school inputs which are utilized in both managerial and instructional processes. In addition, this production function model operates under the variation of the educational context.

It is believed that the school output (Y) is a function of Student Quality (SQ), Teacher Quality (TQ), and Management Quality (MQ), Developmental level of Society (DS), and family Socio-Economic Status (SES). This is then expressed as follows.

Y = F(DS, SES, SQ, TQ, and MQ)

This study was also interested in input dimensions and identified three categories of school quality determinants (Figure 1.1). These are discussed below.

(1) *Student Quality* is indicated by measures of student characteristics, i.e., sex, age, kindergarten attendance, frequency of school absence, frequency of tardiness, educational aspirations, and parental learning assistance.

(2)*Teacher Quality* was broken down into three measurable constructs, i.e., teacher mastery of subject area, seniority, income, and teaching load as the operational measures of *professional capacity*; teacher activities in teaching, such as instructional preparation, use of materials in teaching, use of textbooks, classroom discussions, and fre-

quency of testing the measures of *teacher effort*; and finally, the time allocated to instruction in the classroom as the measure of *teacher time*.

(3) *Management Quality* is composed of two constructs: input and process. On the one hand, the measure of managerial inputs deal with several school variables, such as school size, school facility, classroom equipment, sufficiency of textbooks, and measures of headmaster characteristics. The measures of managerial process, on the other hand, were operationalized in terms of internal school control systems, external supervision, frequency of meeting with teachers, and frequency of meetings with students' parents.

In analyzing the determinants of school quality, the data analysis controlled for the effects of family and community variables; the covariates. These include level of wealth of the census block; average family income; amount of educational, societal, and transportation infrastructures; percentage of educated population; and socio-economic status (SES) of students' family. The SES variables were proxied in terms of housing, lighting, family income, possession of modern goods, percentage of family expenditure for food, and parental education.

COMPARISON MODEL. Some educational process variables may affect student achievement indirectly; others may affect it directly. Both types of variables are considered educational quality variables as long as they in any way significantly influence student learning. They are all malleable in nature. However, among the determinants of student learning, random effect variables are non-policy malleable. There is virtually no way of manipulating such variables to improve educational quality. Therefore, analysis is undertaken to examine the independent effect of individual process variables while important random effect variables, contextual factors, are held constant.

In a linear regression model, the measure of output is the linear or non-linear function of a defined number of process variables included in the model. However, combinations of process variables will vary among sub-samples, because a production function operates differently in accordance with its associated contextual factors. This model can be expressed as follows.

$$Y = F(X_i \mid P)$$

where X_i is the individual process variables SQ, TQ, and MQ, as stated above, and P stands for a random effect variable, such as family socio-economic status and province. In this model, Y is a function of SQ, TQ, and MQ given the level of P. P is a contextual variable that is assumed to be a constant, instead of a variable associated with a school quality measure. Variations that may occur in P will determine the overall process of the concerned educational production function. Therefore, a number

of parallel linear or non-linear equations will have to be made for every level of P as indicated in the following expression.

$$Yp = F(X_i, X_2, X_3 \mid P)$$

The operation of the regression equation is hierarchical. The order of each block of the variables is determined by the researcher, while the order of the individual variables within each block is determined by utilizing a stepwise procedure.

TEACHER QUALITY MODEL. This model was developed to examine measures of teacher quality in relation to student achievement. It was assumed that the higher the quality of a teacher, the more likely it is that his/her students will perform well. Teacher variables, measured by a teacher questionnaire, are identified in the following six groups.

a. *Teacher characteristics* which consist of the following variables, among others: sex, age, monthly income, residence, and employment status.

b. *Professional capacity* measured by pre- and in-service training experiences, such as educational background and in-service training attended, and teaching experience.

c. *Professional effort* measured in terms of professional activities, such as, among others, teaching and non-teaching professional activities, and other tasks to be accomplished.

d. *Professional capacity* measured by level of mastery of subject area content (Mathematics, Science, and Bahasa Indonesia).

e. *Academic achievement* of students in Mathematics, Science, and Bahasa Indonesia.

f. *School supervision* which may be associated with teacher performance.

The model of teacher quality used in this study is as follows.

$$Y = F\ (TC, PC, PE, TD, \text{and } A)$$

Where Y is a measure of student learning as measured in terms of test scores); TC is teacher characteristics; PC is professional capacity; PE is professional effort as measured by teacher activities related to major tasks; TD is time devotion, as measured by the time a teacher allocates for major activities; and A is attitudinal characteristics of teachers toward their teaching occupation.

In this study, teacher mastery of related subject content appears to be a sound measure of teacher quality, since this indicates educational background, in-service training, extent of reading on the subject, experience, and other important teacher quality variables. In this case, it is important

to know what variables(s) affect teacher mastery of subject content as measured by teacher test scores. Therefore, a regression equation is needed to examine what variables are likely to have a significant effect on teacher test scores. The model is as follows.

G = F (TE, In Sr, Inc, Exp, Read, Disc, and Teaching)

Where G is teacher test score; TE is teacher educational background; In Sr is in-service training; Inc is teacher income; Read is frequent reading by teacher; Disc is peer discussion, and Teaching is a number of teaching process variables.

METHOD OF ESTIMATION. In all the models described above, the method of prediction used in the analysis is the Ordinary Least Square (OLS) criteria. This method of estimation is based on a position of a regression line in such a way that the sum of standard error between the actual and the predicted dependent variable is the minimum. Therefore, the predicted score will approach the actual score being analyzed.

d. Data Collection

The Community Study consisted of four sets of data collection:

(1) *Community Questionnaire*
This questionnaire was completed by a group of Census Blocks (see below) elders who discussed each question and then supplied the answers. The code book for this questionnaire is attached as Appendix 2 to this report.

A perusal of the code book reveals that the questions asked concern the distance of the census blocks to major towns (an isolation indicator), the language spoken, the children in different types of schools, the distance to schools, the price of land, wages (for children and adults), prices of staple foods, types of work pursued, public facilities available, types of water and sanitation and the level of educational aspiration for education.

(2) *Participation questionnaire*
The senior administrators of the census blocks listed every child aged 6 to 12 years in the community and indicated for each age the type of school and which class each child (boy or girl) attended, as well as which children did not attend school. The data were analyzed in terms of participation rates for each year group by province. It was not possible to undertake the analyses separately for boys and girls since sex, although collected, was not entered into the files. Appendix 1 presents an example of the form used to collect the information at the census block level.

(3) *Student questionnaire*
Within each census block, 5 children attending the sixth grade were selected at random. Each selected child completed a student questionnaire (see Appendix 3 for the codebook for this questionnaire). The information collected covered sex, age, residence, kindergarten attendance, school subjects, frequency of absence and tardiness (with reason), reason for wanting to study, expected education, perception of the teaching of Indonesian, Math and Science, availability and use of various teaching/learning materials, teaching activities, leisure activities, time spent studying, and parental help.

(4) *Tests in Indonesian language, Math and Science*
Tests were constructed for sixth grade students in these three subjects. They were based on the existing curriculum. More details will be given on the tests in the section reporting the test results.

The School Study consisted of testing one class of sixth grade students within selected schools in each of the three provinces. These students took the same tests as the students in the Community Study. They also completed the same student questionnaire. Other instruments were as follows.

(1) *Family Questionnaire*
The information for this questionnaire was collected from various sources: headmasters, class teachers, students, and parents. The questionnaire yielded data on: sex, age, head of household (and province from which the head of household came), language spoken at home, size of family, type of school attended by children, types of diseases experienced and forms of healing (family, witch doctor, ordinary doctor), parental education and occupation, social status in village, parental income, type of housing and lighting, household goods (e.g., TV, radio, refrigerator, etc.), livestock owned, breakdown of household budget, family interactions, parental attitude toward education of children, facilities for studying at home, and parental planning for children's education.

(2) *Headmaster Questionnaire*
The data include information on sex, age, province of origin, education, teaching experience and a great deal of information on the headmaster, including activities of his daily work and perception of his tasks.

(3) *School Administrator Questionnaire*
The questionnaire was completed by the school administrator, who was typically either the school principal or the deputy school princi-

pal. This questionnaire yields a great deal of information about the school plant and facilities, the health of children, extra-curricular activities, problems within school, the staff, the organization of the school, teacher experiences, teacher salaries, school income and expenditures, instructional time, and enrollment, repetition and dropout rates.

(4) *Teacher Questionnaire*
The respondents were the sixth grade teachers in each school in the sample. The information includes age, sex, marital status, type of housing, size of teachers' family, spouse's occupation, language(s) of instruction, teachers' self-perception of ability in the language(s) of instruction, other employment, teachers' education, teachers' absence, teaching experience, official status, income, total teaching load, teaching activities, teacher upgrading, problems encountered in teaching different courses, organizational and physical aspects of school, parent-teacher interaction, perceived reasons for students' absence and dropout, perceived importance of factors likely to improve achievement, frequency of supervision and supervisors' activities, and teachers' perception of factors likely to influence promotion.

As can be seen from the above, the wealth of data from the questionnaires is great. This report will examine only some subsets of data relevant to participation and achievement. The participation data come from the Community Study and the achievement data from both the Community and the School Study.

CHAPTER 2

PROBLEMS AND ISSUES IN PRIMARY EDUCATION

1. Perspectives on the Quality of Basic Education

Up to the present day, the concept of educational quality has existed in people's minds for the most part only as a broad and general idea. A number of ways of thinking about educational quality have developed as a result of attempts to make this abstract meaning more concrete. Often, however, these emerging attempts to conceive of educational quality in more specifiable terms have only produced more rhetorical abstraction. Concepts of quality have ranged from one set of ideas to another and now need to be carefully translated into proposals for school improvement and operationalized in terms of policy actions.

The Neo-Classical Theorists, as described by Douglas M. Windham (1986) and Johnson (1975), have operationalized the concept of educational quality through the use of an efficiency model. Since the 1930s, the Neo-Classical Theorists have devoted a great deal of attention to measuring and examining empirically the concept of efficiency. They emphasize the use of a quantitative-empirical model based on the analysis of quantitatively measured variables. In the field of Sociology of Education, the Neo-Classical Theorists declare themselves to be "Methodological Empirists" (Karabel and Halsey, 1979). They pay attention to examining and analyzing educational outcomes in relation to a number of independent variables, all quantitatively measured. Both Neo-Classical Theorists and Methodological Empirists regard education from a technological point of view in which the efficiency model is the primary concern in analysis.

In generic terms, efficiency has been defined as the generating of an optimal level of outputs given the minimal level of inputs; or, from another perspective, as maintaining a given level of outputs at a given or lower level of inputs. (Windham, 1986; Levin, 1985). In other words, efficiency results from achieving the highest possible level of outputs by using the lowest possible levels of inputs. Thus effectiveness, the best use of resources, is the base of the broader conception of efficiency – which is additionally concerned with comparing the cost of those resources. Effectiveness concerns estimate the degree to which objectives (quantitative or qualitative) are being achieved. Efficiency estimates add considerations of the costs of achieving these objectives. Efficiency, therefore, cannot be discussed as an isolated concept, apart from questions of effectiveness. That is to say, the broader social goals of an educational system, such as

access and equity, must be considered in estimating effectiveness, as well as student academic achievement.

Two types of efficiency, i.e., technical and economic efficiency, are frequently discussed. Technical efficiency refers to the achievement of specified levels or quantities of physical outputs as the product of the combination of different types and levels of inputs. Economic efficiency refers to the assignment of measures of utility and/or price to the inputs utilized and the outputs achieved.

Both types of efficiency refer to the same conceptual meaning, but involve different modes of application.

Which of the two application modes is more applicable to educational analyses depends upon how an education program is being examined. If an educational program is being examined as a type of "market commodity" in one particular competitive market economy, economic efficiency is the concern. On the other hand, when an educational program is viewed as "public goods", then technical efficiency is the relevant issue in assessing educational quality.

The assumption of a market mechanism appears to be relevant in education, as long as non-compulsory education is being discussed. Non-compulsory educational programs, such as vocational schools or professional education, are limited in supply and their outputs are in demand by the economic system. In this type of market situation, each educational program should have the capability to compete with the others, thus achieving an optimal level of system efficiency (by producing the highest possible level of output at minimal level of inputs). This seems to an important aspect of such educational programs, since they are confronted with many competitors who are striving to generate higher quality levels of output at same or lower cost. These programs thus will force other less efficient (lower or same quality at higher costs) programs out of the market competition.

As Windham (1988) describes, efficient educational programs, operating in a perfect market, are characterized by high capability educational institutions which undertake self-monitoring systems and self-equilibrating processes relative to other competitive educational programs. Viewed from this conception of efficiency, educational quality would be characterized as the capability of individual educational programs or institutions to produce, in the most efficient way, the skilled and capable graduates demanded by a labor market.

However, it should be pointed out that the assumption of a perfect market mechanism is in fact rarely applicable to the field of education, particularly if an educational program has been identified as compulsory or universal in nature. In most cases, basic education is more often

identified as public goods rather than as a market commodity. In this case, issues of equality, equity, and fairness of distribution of educational opportunity become increasingly important, particularly in developing countries. Economic efficiency becomes less important since this type of educational program is regarded as public service. Educational opportunity thus needs to be provided equally and services provided equitably to all members of society. Issues of educational quality are judged in terms of whether or not the provision of education is technically efficient, equally distributed, and equitably managed for all members of society.

Equality and equity in the provision of basic education appear to be the most important issues since the basic educational programs deal with public or state concerns, especially in nation and character building. It may be inappropriate, therefore, to assume that a basic education program is managed within a competitive market environment in which equality, equity and fairness tend to be neglected.

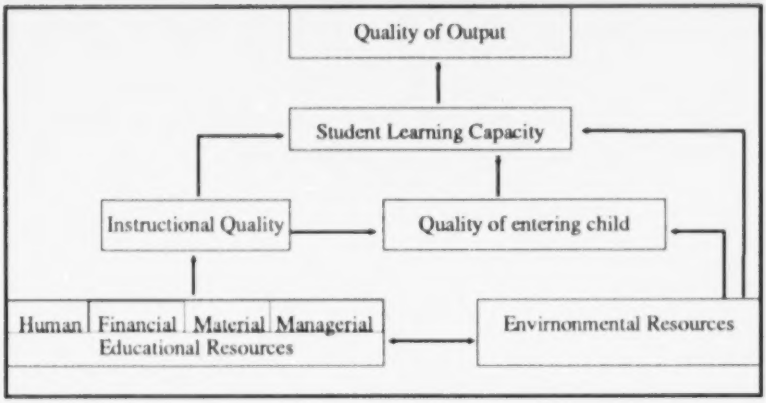
As discussed above, the concept of efficiency is associated with maximizing the utilization of limited resources so as to achieve the optimal level of output. In order to establish an efficient education program, resources should be equitably distributed and efficiently utilized. In other words, an efficient basic educational program is one which is capable of creating a balance between needed and available resources in order to minimize constraints to achieving educational goals. Educational quality, therefore, can be conceived of as the capacity of an educational system to allocate educational resources equitably so that all children have equal opportunity to utilizing those resources and to achieve optimal benefit. Viewed from this perspective, the quality of basic education cannot be separated from the concepts of effectiveness, equality, and equity.

The following discussion of problems and issues concerning educational quality is based largely upon the concept of technical efficiency. Having assumed that basic education is a public good, rather than a market commodity, problems associated with educational access, equity of educational opportunity, and system efficiency become very important policy issues in Indonesia as a developing country. These problems will be explored in this chapter.

A number of issues concerning the basic education system will also be discussed in this chapter to highlight the most important issues to be addressed in policy making for quality improvement. Measures related to environmental context, quality of students, school material inputs, quality of teachers, teaching and learning processes, and school management are all critical issues in efforts to improve educational quality from the technical efficiency perspective. The framework related to those issues is depicted in Figure 2.1.

Figure 2.1

Sources of Educational Quality



2. Conditions of Life in the Three Provinces

It is important to acquaint the reader (especially the non-Indonesian reader) with the conditions of life, as the context of the school system, in the three provinces of this study. The data are taken from the combined data of the three provinces (i.e., the selected 393 census blocks).

The average distance from a census block to the nearest town is 7 kilometers, to the nearest district town is 25 kilometers and to the nearest city is 137 kilometers. The range for the distance to the nearest city is from 0 kilometers to over 500 kilometers. It was estimated by the census block leaders that 80 percent of those living in a census block had been born in the province in which the census block was located and that 20 percent came from other provinces. In 82 percent of the census blocks, only the local language was spoken in daily life, while in 18 percent both local and Bahasa Indonesia were spoken.

Slightly over 50 percent of the census blocks had access to kindergartens (nearly all being private) within the village(an administrative unit). Kindergartens were, on average, 4.5 kilometers away. Each village had, on average, 5 primary schools (3 percent had none), but 42 percent had no private school. The average distance to a public or private school was less than one kilometer from a census block. Nearly 50 percent of the villages had a private Madrasah primary school, while only 5 percent had a public Madrasah school. Only 30 percent had junior secondary schools

and they were, on average, 5 kilometers from a census block; the maximum distance was 35 kilometers. Only 20 percent of census blocks had a senior secondary school of any kind. The ordinary senior secondary school was, on average, 20 kilometers from a census block and a senior vocational education secondary school was, on average, 40 kilometers from a census blocks; the range of distance was 0 to 95 kilometers.

These are agricultural societies. The main crop grown was rice in 70 percent of census blocks, peanuts in 30 percent of census blocks, corn in 14 percent of census blocks; the rest grew fruit and coconuts. Although rice growing is the major work, only 50 percent of the census block population had a rice field available and only 14 percent had a threshing machine.

The average income of those working was judged to be Rp. 63,000. (US$ 61.50, at Rp.2,000 to the dollar) per month. For an agricultural worker, income was estimated at only Rp. 30,000. per month. Out of 10 children aged 7-12 years, it was estimated that only 3 could find employment, should they wish to do so, in a 3-month period. Those children who found employment could expect to earn about Rp. 700. per day. It was estimated that just over 6 adults out of 10 would be able to find a temporary job.

Table 2.1 presents the percentage of census blocks reporting available services and the percentage of census blocks judging that the service was a long distance away. Mosques, family planning clinics and health centers are reported to be widely available and not too distant for most census blocks. Child care centers, public libraries, and supermarkets are scarce. However, for many people, pharmacies, hospitals, theaters and telephone offices are still not available; 94 percent had no public phone. Only 30 percent had asphalt roads in their census blocks, 50 percent had no electricity, 67 percent no TV, and 80 percent did not have access to daily newspapers.

Water is of particular importance for a developed society. Of the 393 census blocks, 82 percent reported that they had no tap water, 61 percent reported no public water pumps (25 percent of those which had public water pumps [39 percent of the total], however, reported that they were broken). Thirty-one percent of the census blocks reported that spring water was used and 44 percent reported that wells were in use (water was hauled up the well by means of a bucket and rope). Six percent of the census block population reported that they had an insufficient supply of clean water, 24 percent felt that the supply was average, and 70 percent felt that they had enough. Twenty percent had either inside or outside toilets, 10 percent used fish ponds, 22 percent a hole in the ground, and the other 46 percent used the local river.

Table 2.1

Availability and Distance of Services (in percent)

Public Facilities	Available	Perceived to be distant
Health Center	84	26
Public Hospital	57	74
Private Hospital	33	87
Child Care Center	17	95
Family Planning Clinic	95	8
Pharmacy	44	74
Public Library	32	85
Sports Hall	87	21
Theater	49	67
Market	76	32
Supermarket	23	88
Telephone Office	49	72
Post Office	62	57
Mosque	98	4
Bank	65	51

The structure of the census block population by education level also is interesting as an indicator of the developmental level of the society. The total population of the 393 census blocks was 138,021. Of these, 23.6 percent had never attended school or not yet gone to school; 27.9 percent had begun primary school, but not completed it; 26.5 percent had graduated from primary school; 6.9 percent had begun junior secondary school, but not completed it; and 5.4 percent had completed junior secondary. Of those who had enrolled in senior secondary school (7.7 percent), only 3.9

percent had graduated. Only two percent of the population had ever enrolled in higher education of any type. Of those who had enrolled in any type of higher education, only 0.6 percent had managed to graduate.

Even though the level of formal education of the society depicted in the study was quite low, the desire of parents for education for their children was extremely high. All parents in the census blocks wanted their children to receive an education, typically at least to completion of junior secondary school.

The picture which emerges from this brief review of the data from the census block questionnaire is of an predominantly rural society, engaged in working the fields and receiving relatively few services. Even obtaining clean water still is a problem for some and poor toilet conditions remain a problem for many.

In terms of educational opportunity, the picture is brighter. Fifty years ago, the Dutch educated only 8 percent of school age children. Since that time, much has been achieved and education participation rates have increased dramatically.

3. Problems Associated with Basic Education

There are three problem areas to be discussed here, i.e., educational access; equality and equity of educational opportunity, and the quality and efficiency of basic education in Indonesia.

a. Educational Access

Problems of educational access must consider the extent to which the school age groups have gained access to the basic education system. This is usually measured in terms of participation rates, such as the percentage of 7-12 year old children who have gained access to the different types of basic education; in-school and out-of-school systems. Participation rates can be understood as the extent to which the government has succeeded in providing basic education for society.

Generally, the participation rate for basic education in Indonesia is extraordinarily high. By 1987, the net enrollment ratio had reached more than 96.5 percent for the 7-12 year old group and approximately 94 percent for the 6-12 group. These enrollment ratios differ from those reported by the 1990 Population Census (Central Bureau of Statistics, 1991) which estimated the percentage of 7-12 year old children in schools to be 91 percent. This difference can be explained, however, by the fact that the 1990 Population Census enrollment ratio was based on the number of student actually registered in school by the middle of the school year and did not count those students who had already dropped out.

One of the most pressing problems shown by this study is that the proportion of 6-12 year old children who have not gained access to basic education appears to be substantial.

Table 2.2 shows that the 6-12 age group not absorbed by the school system was about 8.3 percent in West Jawa, 6.0 percent in South Sulawesi, and 9.0 percent in West Nusa Tenggara (NTB). To put these percentages into perspective, the actual numbers of the 6-year old and 6-12 year old children who are not in school are shown in Table 2.3. These estimated figures show that approximately 850,000 6-year old children in West Java, 200,000 in South Sulawesi, and 90,000 in NTB are not attending school.

Table 2.2
Participation Rates (in percent)

Age	West Java		South Sulawesi		NTB	
(in years)	in School	not in school	in School	not in school	in school	not in school
6	42.9	57.1	70.2	29.8	57.1	42.9
7	87.2	12.8	92.3	7.7	91.4	8.6
8	97.5	2.5	96.6	3.4	95.7	4.3
9	99.2	0.8	98.5	1.5	97.0	0.4
10	99.4	0.6	97.0	3.0	96.2	3.8
11	98.9	1.1	98.3	1.7	99.0	1.0
12	99.4	0.6	97.6	2.4	97.1	2.9
6 to 12 years group	91.71	8.3	94.0	6.0	91.0	9.0

Remarks: For all three provinces together the participation rate for the 6-12 year group is 92.1%. The calculated participation rate for the 7-12 year group is 96.5%.

Table 2.3 shows the challenge for creating a successful compulsory program. Increasing the enrollment ratio in the more populated provinces is much more complex than doing so in the less populated provinces. The figures suggest that each province has much to do to increase the number of pupil enrolled, particularly in the 6 and 7 year-old groups. The percentage of children not in school also suggests that the more densely populated the province is, the larger the number of children aged 6-7 to

be absorbed will be, and thus the number of school facilities which must be provided also will be larger.

Table 2.3
The Actual Number of 6 to 12 Year Olds and the Estimated Number of Children not in school

	N of Population*		Est. Not in School	
Province	6 Year	6-12 Year	6 Year	6-12 Year
West Java	855,565	5,825,188	367,037	483,491
South Sulawesi	190,996	1,328,402	56,917	79,704
NTB	89,315	603,648	38,316	54,328

* Ministry of Environment (1987)

Currently, the provision of basic educational opportunity has been concentrated on one dominant delivery system, the regular primary school, sekolah dasar (SD). In Indonesia, the proportion of SD students is about 90 percent of all primary students, with some variation from one province to another. An important alternative delivery is Madrasah Ibtidaiyah, the Islamic primary school heavily loaded with religious content in the curriculum (as much as 30 percent religious content in addition to the regular SD curriculum.

Another type is the Madrasah Diniyah in which the instruction is almost totally religious. Table 2.4 shows the percentage of children registered in each type of school.

Among the total number of SD schools (163,000), 99 percent are public primary schools. Table 2.4 indicates that the types of basic education institutions are not diversified, since only 7.3 percent of children have been absorbed by alternative primary institutions. In South Sulawesi, alternative delivery systems are even less diversified–only 3.2 percent of children attend schools other than SD. In NTB, the proportion of children attending Madrasah Ibtidaiyah schools is larger compared to the other two provinces. The challenge for each of the provinces is to increase the role of Madrasah Ibtidaiyah schools in absorbing a larger number of pupils in order to increase the net enrollment ratio.

Table 2.4

Number of 6-12 Year Old Children Absorbed by Types of Delivery Basic Education (in percent)

Type of Del. System	West Java	South Sulawesi	NTB
Reg. Primary School (SD)	84.4	90.8	83.2
Madrasah Ibtidaiyah (MI)	4.7	3.2	6.7
Madrasah Diniyah (MD)	0.3	—	0.1
SD + MI	0.8	—	—
SD + MD	1.7	—	—
MI + MD	0.8	—	—
Not in school	8.3	6.0	9.0
Total	100.0	100.0	100.0

b. Educational opportunity

Opportunity for basic education will be examined in terms of whether the opportunity has been equitably provided in comparison across population sub-groups, classified in terms of age of student, sex of student, rural-urban location, and family socio-economic background.

Tables 2.5 and Table 2.6 show that substantial numbers of 6-year-old children have gained access to schools. An interesting trend is that a significant change of dominant age in the first grade cohort has begun to occur. The change is from 7 towards 6 year old dominant groups of first graders. The data collected in 1987 and in 1990 show that the proportion of 6-year-old children enrolled in primary school has been substantially increasing, from 26.4 percent in 1987 to 40.5 percent in 1990. This would change the position of the 6-year-old group, now assumed to have the right to attend school (based on the Education Law No. 2, 1989), to become compulsory group attendance in the future. This change is important for improving the unity of compulsory programs.

Table 2.5
Composition of Students in Schoolsby Grade Level and Age of Student in 1987 (in percent)

	Kelas I	Kelas II	Kelas III	Kelas IV	Kelas V	Kelas VI	Jumlah
< = 6 tahun	26.4	0.8	—	—	—	—	1140
7 tahun	59.2	11.4	0.5	—	—	—	2920
8 tahun	11.2	61.7	8.6	0.3	—	—	3042
9 tahun	2.1	20.0	60.4	9.9	0.5	—	3313
10 tahun	0.7	4.9	25.1	61.5	7.2	0.4	3549
11 tahun	0.2	1.0	4.0	21.4	64.9	4.6	3093
= >12 tahun	0.1	0.3	1.2	6.6	27.4	95.0	3844
	4205	3635	3506	3623	3089	2841	20900

Table 2.6
Composition of Students by Grade Level and Age in Year 1990/1991 (in percent)

Age of Student	Grade level						
	I	II	III	IV	V	VI	Jumlah
< = 6 th.	40.5	1.4	—	—	—	—	54.231
7 th	40.8	32.5	1.6	—	—	—	94.567
8 th.	14.1	41.5	30.0	1.7	—	—	107.046
9 th.	3.2	16.8	39.1	28.1	1.5	—	105.386
10 th.	0.9	5.7	19.4	39.9	27.1	1.8	105.753
11 th.	0.2	1.5	6.9	19.5	40.4	27.6	97.298
= > 12 th.	0.3	0.6	3.0	10.9	30.9	70.5	109.690
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	674.469

Source: Quality Indicator System of SD and MI (1990/91)

Currently, most first graders are in the 7-year-old group. However, their proportion is predicted to decline as it is canceled out by the continuously increasing proportion of the 6-year-old group. This means that the completion of compulsory education will be more effectively achieved if the priority of increasing enrollment is concentrated on the 7-year-old group, since the number of 6 year olds continues to increase by itself.

Expanding educational opportunity for younger children may also indicate an improvement in educational quality in a larger sense. A number of studies on school quality in Indonesia since Moegiadi on SD (1976), Mangindaan on SMP (1979), Jiyono and Ace Suryadi on SMP (1981), and Ace Suryadi on SMP (1986) have shown a consistent finding that the younger a student is, the higher the student's academic achievement. The increasing proportion of 6-year-old children (or younger) in first grade (from 26 to 46.5 percent during a 4-year period) seems to be an extraordinarily rate of increase. This may indicate a increase in the proportion of children who will learn faster.

The proportion of 6-year-old or younger children who are in school varies by school location and type. The proportion of 6-year-old or younger students in schools is higher in urban areas and private schools than in rural and public schools. This suggests that the private schools in urban areas benefit from the higher quality of entering students. In schools outside Java, especially in rural areas, the proportion of overage students (more than 12 years old) appears to be substantial. This indicates that the number of late enrolling students is higher in those areas in which participation rates are lower.

Another indicator of the higher educational quality of the urban and private schools is kindergarten attendance. Kindergarten attendance in the urban schools is 43.6 percent of students, a number which is substantially higher than that in the rural schools, 17.6 percent.

Kindergarten attendance in the private schools is also much higher (54.0 percent) than that in the public schools.

Kindergarten attendance and rural-urban location appear to be indicators of the socio-economic status of students' families. The data show that there are more students from higher SES family enrolled in private-urban schools than enrolled in public schools or rural schools. This would mean that quality in terms of entering students differs substantially, due to differences in school locations (urban versus rural schools) and parental socio-economic status.

Table 2.7

Percentage of Kindergarten Attendance, Female Age Students Group from the Enrollment of Primary Schools

	Percentage of Student Group of:			
Location and Status	Kindergarten Attendance	Female	Underage < 7 Th	Overage > 12 Th
Location				
Kota	43.58	48.04	9.27	4.57
Desa	17.55	48.60	6.81	8.29
School Status				
Public	30.48	48.30	7.75	6.19
Private	53.96	48.76	9.86	5.85
Rata-rata	30.13	48.32	8.04	6.43

The percentage of females enrolled in primary schools is significantly lower than males. This seems to indicate that the opportunity for primary education is still differentiated between the sexes. Forty-eight percent of girls enrolled in schools shows that educational opportunity for boys is about 4 percent higher than for girls. This seems to be a small difference, until it is put into absolute numbers. Put into the national perspective, the difference is substantial--about 1.2 million students. The provision of educational opportunity, therefore, has tended to be biased toward male students.

Finally, we can conclude that educational opportunity for basic education has been biased against students from lower socio-economic status families, and in favor of the urban and male groups.

c. Internal Efficiency

The primary education expansion program in Indonesia which was begun in 1973 has successfully improved access to the school system and has enrollment to approximately 96.5 percent by 1987. Access to school, measured in terms of participation rate, may not necessarily reflect real opportunity to learn, however, unless the education system is internally efficient. The time series data show that dropout and repetition rates have not significantly declined over the last ten years. The national average

dropout rate has not declined for at least the last 10 years. In fact, the drouput rate has increased slightly from 4.0 in 1987 to about 4.2 percent in 1990. The same is true for the repetition rate; within the same period, the national average repetition rate has not changed as expected. The data on both dropout and repetition rates in 1987 are shown in Table 2.8.

Table 2.8

Dropout and Repeaters Rates at Three Points in Time: 1977, 1987, and 1990

	1980		1987		1990	
Grade Level	%DO	%Rep	%DO	%Rep	%DO	%Rep
Grade 1	3.8	15.1	2.8	16.7	2.5	16.2
Grade 2	3.7	12.2	3.0	12.4	3.0	11.6
Grade 3	6.5	9.8	4.8	10.6	4.0	10.3
Grade 4	6.8	7.6	5.1	8.5	5.6	8.1
Grade 5	6.6	5.4	5.3	6.7	5.9	6.2
Grade 6	4.0	1.2	3.3	1.5	4.7	1.2
Average	5.1	9.9	4.0	9.6	4.2	9.7

Data from the school survey show that of 1,000 students registered in the first grade, only 683 students survived to graduate from the sixth grade. This student flow model indicates that the Input-Output Ratio thus is about 70 percent. The index of school attrition was not less than 30 percent. The high rate of repetition means that students, who would be expected to complete schooling within 6 years, in fact delay study time on the average 8.58 years, or 1.5 times the intended schedule (Table 2.9).

This study computed the cost of education per student per year (Unit Cost). This was estimated to be Rp. 150,000 (about US $75.00). Assuming that each student took 6 years to complete primary school, the average cost to produce one graduate (the minimum cycle cost) is about Rp. 900,000 (about US $450.00). In fact, however, the actual cycle cost per graduate is 8.58 times US $75.00–or about US $643.50. If this estimated average cycle cost is then multiplied by the number of graduates, it would

reveal that both government and private schools have wasted a great deal of spending due to the inefficiency of the school system.

Table 2.9

The Average Study Time and Pupil-Years Wasted

		Average study time			Pupil-years wasted		
	Province	Grad	DOs	Cohort	Total	Repeaters	DOs
1	West Jawa	6.37	4.52	5.97	2023	1051	972
2	S. Sulawesi	6.74	4.81	6.18	3616	2206	1410
3	NTB	6.63	4.24	5.59	3705	1851	1854

Estimates of Unit Cost and Cycle Cost for primary schools, based on the data collected by the school survey, are shown in Table 2.10.

Table 2.10

Estimated Unit Cost and Cycle Cost

Province	Unit Cost (in Thousand Rupiahs)	Cycle Cost*(in Thousand Rupiahs)
Jawa Barat	168.17	1,442.9
Sulawesi Selatan	110.88	951.4
Nusa Teng. Barat	170.93	1,466.6
Average	149.99	1,286.9

* Unit cost multiplied by 8.58

4. Issues Related to Educational Quality

Issues related to the basic education system have been organized based on the conceptual framework presented in Figure 1.1., Chapter I. There are three major issues to be presented in this chapter, i.e., Quality of Students, Quality of Teachers, and Quality of School Management.

These issues are assumed to be associated with the quality of basic education.

a. Description of Student "Quality"

Student quality is assumed to be one of the most important variables to affect academic achievement. This study measures student characteristic variables as proxies of student quality. The variables were sex, age, kindergarten attendance, parental learning assistance, educational aspiration, frequency of absence, and frequency of tardiness.

Slightly over half of the students were male, and only about 16% had attended kindergarten. The average age of the students was between 12 to 13 years and more than 80% went to the morning classes. More than 40% of the student were absent sometimes from school for a variety of reasons. Most of the students aspired to pursue their education to the Senior Secondary School level.

Differences among the three provinces exist in terms of the student characteristics measures. West Java had the lowest percentage (13.4%) of kindergarten attendance, while South Sulawesi had the highest (18.1%). Most students in South Sulawesi aspired to pursue study up to Masters level; the highest aspiration level of the three provinces. Student characteristics (excepting aspirations) can be seen in Tables 2.11 and 2.12.

b. Teacher Quality

This study found that, in general, the level of teacher mastery of subject matters tested appeared to be extremely low (Table 2.13 and Table 2.14). The average score of teachers on the Mathematics test was 34.3 out of 58 test items. The highest scores were in Bahasa Indonesia, while the lowest average score was in Science. The teachers sampled from West Java performed better than did the teachers from the other two provinces, while those from South Sulawesi performed at the lowest level.

Most of the teachers (76.8%) were graduates of the primary teacher training (SPG) and they have received in-service training 4-5 times on average. The primary school teachers were mostly male; the number of male teachers being three times larger than females. In NTB, the ratio is eight male for every female teacher. The average years of teaching experience is longer for urban teachers than for rural teachers, i.e., 12.7 compared to 11.0 years. This suggests that the urban teachers are, on the average, more experienced than their rural counterparts.

Table 2.11

Description of Student Characteristics (in percent)

Student Variables	West Java (N=1993)	South Sul. (N=1873)	NTB (N=1919)
1. Male student	52.6	49.0	53.7
2. Live in village	81.9	74.5	80.7
3. Live in small town	8.8	10.9	12.1
4. Live in town	4.1	7.0	4.9
5. Live in provincial capital	4.6	4.9	1.2
6. Attended kindergarten	13.4	18.1	13.6
7. Shift attended			
Morning	84.9	83.7	92.5
Afternoon	6.9	11.4	4.2
Alternating	8.2	4.9	3.3
8. Absence from school last three months			
Never	57.6	59.4	48.7
1-4 times	38.0	35.7	43.4
5-15 times	0.6	0.7	1.5
More than 15 times	3.8	4.2	5.3
9. Parents help in Bahasa			
Never	31.0	35.0	49.0
Sometimes	36.0	26.0	23.0
Often	33.0	39.0	28.0
10. Parents help in Mathematics			
Never	21.0	25.0	42.0
Sometimes	36.0	29.0	28.0
Often	43.0	47.0	40.0
11. Parents help in Science			
Never	30.0	34.0	50.0
Sometimes	41.0	29.0	22.0
Often	29.0	37.0	28.0

Table 2.12

Selected Student Variables by Province (Means)

Student Variables	West Java (N=1993)		South Sul (N=1873)		NTB (N=1919)	
	Mean	SD	Mean	SD	Mean	SD
Age (in years: months)	12:8	1.0	12:8	1.1	12:9	1.0
Hours per week studying:						
Bahasa Indonesia	4.9	2.7	5.2	2.8	12.9	1.0
Mathematics	4.7	2.4	4.8	2.4	4.7	2.3
Science	3.5	2.3	3.7	2.2	2.6	2.0

Table 2.13

Description of Teacher Quality Variables by School Location

Variables		Rural (N=1115)	Urban (N=4533)
1. Mastery of Mathematics	Mean SD	42.3 8.2	44.7 8.4
2. Mastery of Indonesian	Mean SD	34.3 6.2	36.1 5.7
3. Mastery of Science	Mean SD	22.4 5.1	22.7 5.4
4. Educational Background (%)			
a. Junior Secondary School		0.5	0.4
b. Primary Teacher Training		80.2	77.5
c. Senior Secondary School		9.9	7.3
d. Associate Degrees		2.5	0.4
e. BA		5.5	6.5
f. MA		1.4	8.0
5. Years of Teaching Experience	Mean SD	11.0 6.5	12.7 7.0
6. Frequency of in-service training attended	Mean SD	4.0 6.5	4.6 5.8

Table 2.14

Description of Teacher Quality Variables by Provinces

Variables		W. Java (1993)	S. Sul. (1873)	NTB (1919)
1. Mastery of Mathematics	Mean	44.9	41.0	42.2
	SD	7.7	8.7	8.0
2. Mastery of Bhs Indon.	Mean	35.5	32.9	35.3
	SD	5.6	6.4	6.0
3. Mastery of Science	Mean	23.7	21.0	22.6
	SD	4.8	5.3	5.1
4. Educational Background (%)				
a. Junior Secondary School		0.3	0.8	0.8
b. Primary Teacher Training		80.1	79.5	77.8
c. Senior Secondary School		9.8	5.7	12.9
d. Associate Degrees		4.5	0.8	0.8
e. BA		2.3	9.3	6.6
f. MA		3.0	4.0	1.6
5. Years of teaching experience	Mean	10.6	12.7	10.8
	SD	6.3	7.8	5.4
6. Frequency of in-service training attended	Mean	3.3	4.6	4.4
	SD	4.6	7.2	6.9

c. Quality of School Management

The best measure of school management quality is the assessment of the actual managerial process in support of instruction. Unfortunately, it is very difficult to measure the managerial process, since the observable process may not necessarily indicate the actual capacity of the school management. The managerial process is concerned with the information flow and processing system in support of organizational decision making.

This study observed the proxy rather than the direct measures of management quality, such as managerial inputs, principal characteristics, and managerial activities coordinated by the headmaster.

The schools in West Java generally are better equipped than are those in the other two provinces (Table 2.16). There are more schools in West Java equipped with sufficient teacher rooms, libraries, laboratories, and cafeterias. In contrast, the schools in NTB appear to be the least well equipped. However, schools in West Java experience a scarcity of students' and teachers' desks. This is due to the fact that most of the schools in Java have extremely large enrollments which have resulted in the sharing of desks.

The percentage of schools provided with a sufficient number of textbooks was practically the same for each of the three provinces. However, there are more schools in West Java which have sufficient textbooks than there are in the other two provinces. The data suggest that the further the province is from Jakarta, the less likely it is to be equipped with adequate school facilities and textbooks. Almost the same results were also shown in the comparison between schools in rural and urban areas.

Table 2.17 shows no difference among the three provinces in the measures of managerial activities. Principals' (Headmaster) activities in evaluating, observing, correcting, and improving the routine activities of a school system can be identified as important management variables. These are categorized as measures of "internal control management". Supervising activities, editing written teaching preparation, and observing instruction are activities that are conducted more frequently by the principal, while guiding teachers to improve mastery of subject matters is the least frequent activity.

The other important issue is that the so-called "external management relation". This does not appear to be as yet well developed in the Indonesian school system as most schools have never engaged in comparative study with other schools, attended outside meetings, or discussed school planning with Sub-District Officers. Table 2.18 presents the urban-rural breakdown of managerial activities.

Table 2.15

Percentage of Schools with Sufficient School Facilities by School Location

	Rural (N=1115	Urban (N=4537)
School Facilities		
1. Teacher room	37.0	43.5
2. Library	26.0	36.6
3. Laboratory	5.1	6.1
4. Cafeteria	8.0	14.0
5. Toilet	59.0	73.5
Classroom Equipment		
1. Student Desks	35.1	43.6
2. Teacher Desks	36.0	55.2
3. Calculator	6.9	7.2
4. Blackboard	67.6	78.2
Books		
1. First Grade Textbooks	40.6	51.1
2. Second Grade Textbooks	40.4	51.8
3. Third Grade Textbooks	46.1	54.4
4. Fourth Grade Textbooks	51.1	55.9
5. Fifth Grade Textbooks	50.8	54.7
6. Sixth Grade Textbooks	50.1	50.1
7. Teacher Guide Books	47.2	54.0

Table 2.16

Percentage of Schools Provided with Sufficient School Facilities by Provinces

	West Java (N=1993)	South Sul. (N=1873)	NTB (N=1919)
I. School Facilities			
1. Teacher room	50.2	30.2	33.1
2. Library	32.4	36.3	16.8
3. Laboratory	6.0	6.8	3.1
4. Cafeteria	7.5	11.3	8.9
5. Toilet	57.1	62.3	66.5
II. Classroom Equipment			
1. Student Desks	33.1	38.6	37.9
2. Teacher Desks	31.5	52.5	35.3
3. Calculator	7.5	2.4	10.9
4. Blackboard			
III. Books			
1. First Grade Textbooks	47.4	34.4	44.9
2. Second Grade Textbooks	46.7	35.1	45.2
3. Third Grade Textbooks	49.4	41.3	51.8
4. Forth Grade Textbooks	53.2	48.3	53.5
5. Fifth Grade Textbooks	51.7	50.5	51.3
6. Sixth Grade Textbooks	49.4	49.7	49.6
7. Teacher Guide Books	60.1	34.8	49.5

Table 2.17

Modes of Managerial Activities Done by Headmaster by Provinces

(1=Never; 2=Rare; 3=Frequently; 4=Very Frequently)

Type of Managerial Activities	West Java (N=1993)		South Sul. (N=1873)		NTB (N=1919)	
	Mode	(%)	Mode	(%)	Mode	(%)
Internal Control Management						
1. Supervision of teacher act.	3	30.8	3	31.5	3	30.8
2. Correcting teaching prep.	4	55.4	4	45.9	4	55.4
3. Observe classroom teaching	3	41.1	3	34.4	3	41.1
4. Guide teachers on subject matter contents	2	40.0	2	47.3	2	40.0
External Management Relations						
1. Visit students' parents	2	42.2	2	35.8	2	42.2
2. Comparative study	1	71.2	1	78.6	1	71.1
3. Attending outside meeting	1	52.1	1	41.4	1	52.1
4. Discuss school planning with the District Office	1	42.3	1	60.4	1	52.1

Table 2.18

Modes of Managerial Activities Done by Headmaster by Location

(1=Never; 2=Rare; 3=Frequently; 4=Very Frequently)

	Rural (N=1115)		Urban (N=4537)	
	Mode	%	Mode	%
Internal Control Activities				
1. Supervision of teacher act.	3	31.7	3	30.8
2. Correcting teaching prep.	4	46.5	4	59.7
3. Observe classroom teaching	3	38.3	3	37.8
4. Guide teachers on subject matter contents	2	42.7	2	36.1
External Management Relations				
1. Visit students' parents	2	39.6	3	35.8
2. Comparative study	1	77.1	1	67.7
3. Attending outside meeting	1	57.5	1	51.8
4. Discuss school planning with the District Office	1	41.4	2	38.6

CHAPTER 3

DISPARITY IN ACADEMIC ACHIEVEMENT

1. Level of Sixth Grade Students' Academic Achievement

Item analysis was undertaken on the three student achievement tests using the same sample. Both the distribution of responses to options, as well as the point biserial correlations of each distractor with the total score were examined. Where the point biserial for the correct answer was less than 0.1 or, in some cases, negative, the item was dropped. Given the characteristics of the test items as described in Table 3.1, it was decided to use only total scores in further analyses, especially in the multivariate analysis reported later.

This study generally observes a low level of student academic achievement as seen in terms of the percentage of correct answers from the number of items in the three subject areas tested. This level of mastery was virtually the same as the one measured in the previous Grade 6 Survey 13 years ago (Moegiadi, 1976). It is true to say that both achievement test scores can not be directly compared since the items used and the students tested were different. However, both tests were derived from a shared test blueprint based on the same national curriculum. Comparison of the two sets of scores will provide some explanation of the development of national average academic achievement.

The average level of student achievement measured by this study varies across subject areas. The percentage of correct answers in Mathematics and Science are lower than in Bahasa Indonesia; average scores in mathematics being the worst. Student scores in mathematics also range larger than that in the other two subject areas.

In comparison with the 1976 study, students seem to face more difficulty in mastering mathematics than the other two subject areas. The difficulty has been increasing lately. In terms of percentage of correct answers, the average scores measured in this study are better in Bahasa Indonesia, better in Science, but much worse in Mathematics than those measured in 1976. This finding supports emerging criticisms of Mathematics instruction as it exists in the 1975 and 1984 national curriculum.

Table 3.1

Student Academic Achievement Scores in Bahasa Indonesia, Mathematics, and Science

A. Current Study (1989)			
Statistics	Bhs. Indon. n = 5533	Math n = 5757	Science n = 5790
1. Mean	27.7	21.6	24.2
2. Standard Deviation	7.9	8.7	6.8
3. N of Items	47.0	49.0	47.0
4. % Correct Answer	58.9	44.1	52.5
B. Previous Sixth Grade Survey (Moegiadi, 1976)			
1. Mean	35.0	33.0	27.0
2. Standard Deviation	12.0	9.0	8.0
3. N of Items	60.0	60.0	60.0
4. % Correct Answer	49.0	55.0	45.0

Table 3.2

Sub-Scores in Mathematics and Science

Subject areas	N of Items	N of Students	Mean	SD	% of correct
Mathematics Total	49	5790	21.6	8.7	44.1
Sub-scores: Sets	1	5790	0.42	0.5	—
Arith.	31	5790	14.0	6.3	45.2
Geom/Trig.	13	5790	5.4	2.4	41.5
Alg.	4	5790	1.7	1.1	—
Science Total	47	5790	24.2	6.8	51.5
Sub-scores: Biology	24	5790	13.3	3.8	55.4
Chemistry	1	5790	0.54	0.5	—
Physics	22	5790	10.4	3.6	47.3

In this study, scores in Mathematics and Science were broken down into sub-scores. Each of the sub-scores has a different number of items. The Mathematics test (47 items) mostly consists of items measuring arithmetic concepts (31 items) and Geometry (13 items), whereas the science test (47 items) mostly consists of items measuring concepts of Biology (24 items) and Physics (22 items). The sub-score analyses in Mathematics show imbalances among concepts examined in the test. Concepts of arithmetic were dominant in the test compared to other concepts such as sets, geometry, and algorithms in terms of number of items as well as levels of mastery in each sub-score area. The last three mathematical concepts mentioned emphasize abstract mathematical thinking rather than practical computations as would be more appropriate for children at that age. So it is logical that students would master arithmetic more easily than sets, geometry, and algorithms.

The analyses of sub-scores in Science shows another interesting finding. The students' average sub-score on physics was being left far behind compared to other sub-scores in Science. This may indicate that, on average, the present instructional processes in Indonesia have not yet emphasized the importance of physics in the science curriculum. The following sections discuss differences in average academic achievement associated with other variables. On the one hand, the observed differences of achievement may be determined by structural variables. On the other hand, these may also be determined by process variables. A structural variable will determine variation in achievement through its random effect that is non-malleable in nature. A process variable, on the other hand, emphasizes a process of interaction that may influence student learning. This type of variable is manipulatable by educational policy.

2. Differences Due to Structural Variables

Differences in students' academic achievement among provinces, between school geographical locations, and socio-economic status (SES) of students' families appear to be interesting. It is interesting since the three random variables are not identified as educational policy manipulatable. Therefore, the existence of achievement variation due to differences in province, rural-urban location, and socio-economic status is random and educational policy may not be able to affect this variation. This means that the gaps in student academic achievement that exist among provinces, geographical locations, and SES are structural in nature.

Nevertheless, the province, school location, and SES of students' families are variables that might also be proxies of values and processes that strongly influence student learning, though they are not easily identified through studies of this kind. In order to reduce uncertainty, it is

necessary to further investigate what process variables or values happen to vary among provinces and between rural-urban locations and SES which may lead to differences in student academic achievement.

In all three subject areas (Mathematics, Science and Bahasa Indonesia), students in West Java performed better than did students in South Sulawesi and NTB. The difference in achievement between West Java and NTB was one-third of a standard deviation in Mathematics, and one-half standard deviation in both Science and Bahasa Indonesia (Table 3.3).

Table 3.3

Student Achievement Scores Within Provinces

Subject	N of Items	West Java (N=1971)		S. Sul. (N=1853)		NTB (N=1909)		All (N=5735)	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
B. Indo.	47	28.3	7.5	27.3	7.5	24.9	7.8	26.9	7.7
Math.	49	22.4	8.7	21.2	8.3	19.8	8.1	21.1	8.4
Science	47	25.8	6.7	23.4	6.8	22.1	6.8	23.8	6.9

Differences in academic achievement also are observed in comparisons between rural and urban schools. These differences have been consistently observed since the earlier achievement study was conducted in 1976. This study observes that students in urban areas performed one-half standard deviation better on the mathematics test than did students in rural areas, and the same is true for the other two subject matters (Table 3.4). These are considerable differences. The average academic achievement also differs by levels of family socio-economic variables. The data in Table 3.5 show that higher average scores of academic achievement in the three subject areas tend to be associated with speaking more Bahasa Indonesia at home, higher parental education, higher family income, and better home lighting. In many studies, these home background variables are used as indicators of socio-economic level of a family. These appear to be important random effect variables that, as has been found in many studies, lead to significant disparity of academic achievement.

Table 3.4

Student Academic Achievement by School Location

Subject	Urban Mean (N=4537)	Urban SD	Rural Mean (N=1115)	Rural SD
1. Mathematics	23.5	8.2	19.3	7.4
2. Science	26.5	6.7	23.2	6.8
3. Bahasa Indonesia	29.6	7.2	25.3	7.5

Table 3.5

The Average Academic Achievement by Category of Socio-economic Variables

Soc. Ec. Vars	Bhs Ind. Mean	Bhs Ind. SD	Mathematics Mean	Mathematics SD	IPA Mean	IPA SD	N
Home Lighting							
Kerosene lamp	26.4	8.1	20.2	9.0	22.8	7.3	2455
Lantern	26.9	8.1	21.1	8.7	23.7	7.0	694
Electricity	27.8	7.6	22.0	8.2	24.7	6.6	2586
Language Spoken at home							
Local	26.7	8.0	20.7	8.7	23.5	7.0	4668
B Indonesia	28.7	7.6	22.7	8.1	24.6	6.7	1067
Parent Education							
None	26.5	8.3	19.0	9.3	21.6	7.2	860
Primary	26.8	7.9	21.0	8.3	23.8	6.9	2994
Junior Sec.	27.5	7.8	21.8	8.7	24.6	7.1	682
Senior Sec.	27.6	7.9	22.0	8.0	24.6	6.4	918
Higher Ed	28.6	7.4	22.5	8.1	24.2	6.5	287
Family Income							
Lower (<91000rp.)	25.6	7.8	20.3	8.7	23.1	6.8	4083
Higher (>90,000rp.)	27.5	7.4	23.8	8.1	25.4	6.7	1652

Differences in average scores of student achievement tend to be associated with differences in school quality by measures of appropriate school provisions. The data in Table 3.6 show that schools in West Java, on average, were provided with more sufficient educational facilities, such as headmaster rooms, teacher rooms, libraries, laboratories, teacher guidebooks, and student textbooks than those in the other two provinces. This may also mean that South Sulawesi and NTB have more isolated schools than West Java and are confronted with more geographical problems in providing educational resources equally to schools (Table 3.6).

Table 3.6

Selected School Variables by Province (in percent)

Variables	West Java (N=133)	S. Sulawesi (N=130)	NTB (N=133)
School facilities available			
Headmaster's room	65.7	61.8	50.0
Teacher's room	50.0	29.8	32.8
Health Unit	23.1	15.3	3.7
Library	32.1	25.9	16.4
Laboratory	6.0	5.9	3.0
School yard	65.7	70.2	50.0
Teachers residence	42.5	75.6	85.1
Canteen	7.5	10.7	9.0
Toilet	56.7	61.1	64.9
Sufficient bookshelves	42.9	42.6	34.4
Sufficient Teacher Guidebooks			
Bahasa Indonesia	44.0	22.0	40.0
Mathematics	61.0	35.0	49.0
Science	47.0	31.0	33.0
Sufficient Student Textbooks			
Bahasa Indonesia	30.0	17.0	21.0
Mathematics	49.0	50.0	48.0
Science	37.0	29.0	30.0

The differences between urban versus rural schools in the provision of school facilities appear more distinct than that among provinces. Schools in rural areas suffered from insufficient school facilities compared to schools in urban areas. Table 3.7 shows that more schools in rural areas than in urban areas were lacking in school facilities, classroom equipment and textbooks. The differences in average scores of achievement have been associated with differences in adequacy of school provisions. It is obvious that more students of schools in West Java, in urban areas, and from higher socio-economic families perform better in academic testing than their counterparts. More clearly stated, better academic scores are achieved by students who come from families with higher average income, better housing, higher educated parents, better home lighting; from societies better equipped with public facilities and transportation infrastructure; and from schools better provided with school facilities, classroom equipment, and adequate textbooks. From the explanations above, it may be suggested that the more developed a society is, the more likely it is that students will perform well in academic testing. However, this finding means little for quality improvement policy since the developmental level of a society only randomly affects achievement. As a matter of fact, differences in academic testings due to family socio-economic background may be more explainable. One interpretation is that the higher the level of socio-economic status, the more likely it is that a family situation is conducive to children's home learning. In that case, it is reasonable to say that the more developed a society is, the greater the number of higher socio-economic status families will be.

However, the socio-economic level of a family may not appropriately explain differences in achievement because a home background variable is in fact hard to measure and is non-manipulable. Student's birth into a rich family is random and often can not be associated with effectiveness of home learning. Whether or not the achievement level of those students is affected by home learning is not the right question in this study. The right question rather is to what extent student achievement is determined by school quality, whenever the effect of socio-economic variables are taken into account. This question is subject to further investigation.

3. Differences Due to Process Variables

This section presents comparisons between two groups of schools, identified as lowest and highest performing schools, with respect to process variables. A higher or lower performing school is identified from an individual student residual score. The value of the residual score was positive for a student if he/she performed better than would be predicted from a knowledge of his/her home background. Similarly, the residual

score would be negative if the student was performing at a lower level than would be predicted from a knowledge of his/her home background. This means that a student performs at a certain level of achievement irrespective of socio- economic influences. Variations in achievement that might exist among students are assumed to be influenced more by learning process variables, especially school quality variables, than by family socio-economic status.

Table 3.7

Percentage of School with Sufficient School Facilities by School Location

	Rural (N=1115)	Urban (N=4537)
I. School Facilities		
Teacher room	37.0	43.5
Library	26.0	36.6
Laboratory	5.1	6.1
Cafeteria	8.0	14.0
Toilet	59.0	73.5
II. Classroom Equipment		
Student Desks	35.1	43.6
Teacher Desks	36.0	55.2
Calculator	6.9	7.2
Blackboard	67.6	78.2
III. Books		
First Grade Textbooks	40.6	51.1
Second Grade Textbooks	40.4	51.8
Third Grade Textbooks	46.1	54.4
Fourth Grade Textbooks	51.1	55.9
Fifth Grade Textbooks	50.8	54.7
Sixth Grade Textbooks	50.1	50.1
Teacher Guidebooks	47.2	54.0

Variables of family income, parental occupation, father's education, and possession of modern goods at home were selected to form a home background construct. The slopes of each home background variables and the constant were calculated and are presented in Table 3.8. The model used in building the home background construct is as follows.

$$Y = A + B_1(F.In) + B_2(P.Occ) + B_3(F.Ed) + B_4(F.Poss) + E$$

$$\hat{Y} = A + B_1(F.In) + B_2(P.Occ) + B_3(F.Ed) + B_4(F.Poss)$$

$$E = \hat{Y} - Y$$

Where Y is actual score; $\hat{Y}$ is predicted score; B's are slopes; A is a constant; and E is a residual score.

Table 3.8

Slopes of Constants in Metric Regression of Socio-economic Variables

Variables	Bhs. Indo	Mathematics	Science
Family income (F.In)	.16022	.29150	.13988
Parent occupation (P.Occ)	.13517	.07855	.10627
Father's education (F.Ed)	.37468	.50547	.32712
Family Possessions (F.Poss)	.85391	.52781	.72084
Constant	22.92222	17.24312	20.60985

Using the above calculated regression weights and their respective constant, predicted scores were constructed for each of the outcome measures for each student. Based on data seen in Table 3.8, the predicted score of Mathematics can be computed as follows.

$$\hat{Y}(math) = 17.24312 + .29150(F.In) + .07855(P.Occ) + .50547(F.Ed) + .52781(F.Poss)$$

The same steps can also be followed to calculate predicted scores of Bahasa Indonesia and Science. Following the construction of the predicted

students' scores, a residual score was calculated for each student by subtracting the predicted score from the actual score. For example, the residual score for Mathematics was calculated as follows.

$$E(math) = Y(math) - \hat{Y}(math)$$

Where E(math) is a residual score of mathematics; Y(math) is an actual math score; and Y(math) is a predicted math score.

These student residual scores were then aggregated to the school level. Therefore, schools with a high negative residual score were associated predominantly with students performing below expectation, and schools with a large positive residual score were associated predominantly with students performing above expectation. The schools within each province were then ranked in ascending order from the largest negative to the largest positive residual score. This list represents a statistical approximation of the order of schools which would be achieved were all students to come from the same home background. The list, therefore, provides an opportunity to explore the structural and process variables associated with the school and community environment.

The ten highest (top) schools and lowest (bottom) schools within each of the three provinces then were identified within each subject. In each subject, therefore, 30 schools were thus identified as lowest and highest performing schools. However, only schools with more than 10 pupils were selected from the list to ensure that there were sufficient pupils in a school to ensure a reasonably stable school mean score.

The province and school numbers of the ten best and worst schools in each province, after adjustment for the home background of the students, were compared (Table 3.12). Two schools (45 and 87) performed better than expected in all subjects. In South Sulawesi, there were no schools which were poor in all subjects, but four schools (47, 78, 96, and 124) were better than predicted in all subjects. In NTB, there are also no schools which were worse than predicted in all subject areas, but three schools (22, 77, and 103) achieved better than expected in all three subject areas.

Characteristics of the "better" and "worse" performing schools can then be compared. For each of the independent variables on the working files, means or percentages were calculated on the top 10 and bottom 10 performing schools in each province.

The following are differences on some variables which have been extracted from the comparison between the lowest and the highest performing schools. A difference is significant when it is larger than one

quarter of a standard deviation. If so, then that variable has the power to discriminate student achievement.

The major differences between the highest and lowest performing schools, are presented in Tables 3.9, 3.10, and 3.11. These tables show systematic associations with differences in certain school quality variables, especially teacher and school variables. Based on these tables, the highest performing schools, irrespective of home background influences, are identified as having the characteristics described below.

The highest performing schools have teachers who perform better in Bahasa Indonesia, Mathematics, and Science testing; are less frequently absent from teaching tasks; work fewer hours at other jobs; perceive themselves to have less difficulty in teaching; and have more years of teaching experience. The highest performing schools have more parallel classes; are larger schools; offer more instructional time in Bahasa Indonesia, Mathematics, and Science; and have teachers whose average salary at least is higher (at last in S. Sulawesi and NTB). "Better" schools are more likely to be associated with students who are from more affluent homes, which have better lighting, where Bahasa Indonesia is spoken more, and where the parents help their children more often with their homework. The children in better schools tend to be absent less frequently from schools than the children in the poorer schools. Again, the results tend to be similar for the three subject areas.

The tables are based only on the 20 schools per province. Before drawing any strong conclusions from the above data, it is useful to examine the relative predictive powers of the variables on the working file for all schools in the sample.

Table 3.9

Student, Teacher, and School Variables for Bahasa Indonesia in Top and Bottom 10 Schools

Variable		West Java			S. Sulawesi			NTB		
		Top	Bottom	Diff.	Top	Bottom	Diff.	Top	Bottom	Diff.
Student	* Home Language	1.3	1.2	0.1	1.8	1.1	0.7	1.3	1.1	0.2
	* Home Lighting	1.9	1.6	0.3	3.1	1.4	1.7	2.2	1.4	0.8
	* Student Absence	1.3	1.7	-0.4	1.5	1.7	-0.2	1.6	1.8	-0.2
	* Parental Help	6.5	6.1	0.4	6.5	5.5	1.0	4.8	5.9	-1.1
	* Total Cost Exp. (000 rp.)	43.7	27.7	16	121.1	36.0	85.1	43.2	24.4	18.8
Teacher	* Teacher Score in Bahasa Indo.	36.5	30.0	6.5	35.3	28.6	6.7	38.5	34.2	4.3
	* Teacher Absence/ Sickness	3.1	5.2	-2.1	3.8	6.0	-2.2	5.1	8.2	-3.1
	* Years of Teaching Experience	12.4	10.9	1.5	10.7	11.6	-0.9	10.7	9.5	1.2
	* Percentage of Difficulty Teaching	3.8	4.5	-0.7	4.3	4.4	-0.1	3.2	4.6	-1.4
	* Hours of Other Jobs	1.3	3.0	-1.7	0.2	1.9	-1.7	0.2	1.9	-1.7
	* Number of Classes	3.3	2.5	0.8	3.9	2.9	1.0	3.8	3.0	0.8
	* Av. Tch. Salary/ Month (000 rp)	95.0	83.0	12.0	103.0	106.0	-3.0	92.0	75.0	17.0
School	* Intruct. time for Bhs. Indo	5.4	4.6	0.8	5.5	5.5	0	4.8	4.6	0.2
	* Class Size (N.Students)	288	233	45	291	200	91	247	200	47

Table 3.10

Student, Teacher and School Variables for Mathematics in Top and Bottom 10 Schools

Variable		West Java			S. Sulawesi			NTB		
		Top	Bottom	Diff.	Top	Bottom	Diff.	Top	Bottom	Diff.
Student	* Home Language	1.4	1.3	0.1	1.8	1.2	0.6	1.5	1.4	1.1
	* Home Lighting	2.6	2.1	0.5	3.1	1.9	1.2	2.1	1.7	0.4
	* Kindergarten	1.2	1.0	0.2	1.4	1.1	0.3	1.2	1.1	0.1
	* Student Absence	1.4	1.7	-0.3	1.5	1.6	-0.1	1.4	1.6	-0.2
	* Parental Help	6.8	6.1	0.7	6.8	6.2	0.6	6.2	5.6	0.6
	* Total Cost Exp. (000 rp.)	83.6	44.6	39.0	89.4	38.6	50.8	45.9	32.5	13.4
Teacher	* Teacher Score in Mathematics	48.3	40.2	8.1	45.9	37.8	8.1	46.5	38.6	7.9
	* Years of Teaching Experience	16.7	10.2	6.5	15.3	10.9	4.4	11.4	8.2	2.2
	* Percentage of Difficulty Teaching	4.6	4.6	0.0	3.9	4.3	-0.4	3.2	4.4	-1.2
	* Hours of Other Jobs	1.5	3.2	-1.7	0.1	0.2	-0.1	1.9	5.2	-3.3
	* Tch. Salary/ Month (000 rp.)	91.7	81.8	9.9	106.7	96.1	10.6	90.0	82.4	7.6
School	* Instr. Time for Mathematics	5.6	3.7	1.9	4.7	4.1	0.6	5.1	4.4	1.7
	* Teaching Guidebooks	1.5	1.5	0.0	1.8	1.8	0.0	1.4	1.7	-0.3
	* Math. Textbooks	2.0	1.5	0.5	1.4	1.5	-0.1	1.4	1.7	-0.3
	* Mathematics Textbooks Used	2.6	2.3	0.3	2.8	2.5	0.3	3.0	2.5	0.5
	* Class Size (N of Students)	30	33	-3	39	31	8	36	33	3

Table 3.11

Student, Teacher and School Variables for Science in Top and Bottom 10 Schools

Variable		West Java			S. Sulawesi			NTB		
		Top	Btm.	Diff.	Top	Btm.	Diff	Top	Btm.	Diff
Student	* Home Language	1.1	1.2	0.1	1.9	1.4	0.5	1.2	1.1	0.1
	* Home Lighting	2.1	1.8	0.3	2.9	1.9	1.0	2.0	1.5	0.5
	* Kindergarten Attendance	1.2	1.1	-0.1	1.3	1.2	0.1	1.1	1.2	-0.1
	* Student Absence	1.4	1.8	-0.4	1.4	1.6	-0.2	1.5	1.9	-0.4
	* Parental Help	6.9	5.7	1.2	6.4	5.9	0.5	4.9	5.7	-0.8
	* Age of Student	12.7	12.6	0.1	12.9	12.8	0.1	12.8	12.5	0.3
	* Total Exp. (in 000 rp.)	56.5	33.4	23.1	97.1	52.8	44.3	32.4	33.2	-0.8
Teacher	* Teacher Score in Science	24.2	23.4	0.8	21.6	21.2	0.4	25.1	22.0	3.1
	* Years of Teaching Experience	12.8	10.4	2.4	16.1	10.1	6.0	10.3	9.8	0.5
	* Percentage of Difficulty Teaching	3.8	4.3	-0.5	4.0	4.4	-0.4	3.9	4.5	-0.6
	* Tch. Salary/ Month (000 rp.)	93.5	81.6	1.9	105.6	82.2	23.4	95.8	83.9	11.9
School	* Instr. Time for Science	4.1	3.2	0.9	3.6	3.4	0.2	4.0	2.8	1.2
	* Science Textbooks	1.6	1.6	0.0	1.3	1.8	-0.5	1.8	1.6	0.2
	* Science Textbooks Used	2.5	2.1	0.4	2.9	2.5	0.4	2.8	2.6	0.2
	* Class Size (N of Students)	36	34	2	45	31	14	36	29	7

Table 3.12

List of School Numbers by Province Used as Top and Bottom10 Schools in the Three Subect Areas

Number	Negative Residual			Positive Residual		
	W. Java	S. Sul.	NTB	W. Java	S. Sul.	NTB
I. Bahasa Indonesia						
1	5	67	65	81	96	22
2	77	49	129	37	68	77
3	124	4	134	71	110	97
4	15	43	93	87	47	133
5	7	10	85	83	75	75
6	11	101	92	80	124	108
7	52	31	9	45	78	78
8	94	7	96	24	99	16
9	3	17	98	57	73	101
10	2	85	111	112	86	83
II. Mathematics						
1	124	23	110	45	47	133
2	78	69	114	57	96	120
3	15	105	126	44	124	22
4	35	5	59	87	72	105
5	7	123	98	80	133	97
6	77	67	23	25	92	77
7	11	76	69	49	39	49
8	3	90	105	86	78	125
9	5	118	5	36	120	124
10	120	114	123	81	86	132

Table 3.12 (continued)

No.	Negative Residual			Positive Residual		
	W. Java	S. Sul.	NTB	W. Java	S. Sul.	NTB
III. Science						
1	124	49	35	87	12	16
2	77	114	129	79	68	22
3	3	13	127	81	96	77
4	7	17	134	31	78	133
5	5	116	85	51	24	75
6	118	109	93	36	132	68
7	15	110	114	84	47	7
8	11	29	115	52	124	118
9	117	5	65	60	100	23
10	35	8	113	45	73	31

CHAPTER 4

SCHOOL QUALITY AND ACADEMIC ACHIEVEMENT

This chapter presents the analysis of school quality variables as determinants of student academic achievement. Regression analyses were undertaken based on the "analytical models" developed for this study, as described in Chapter One. The models are: Preliminary Model; Full Model; Comparative Regression Models by provinces, and geographic location of the school system (comparison between "rural-poor" versus "urban-middle class" sub-samples); and finally the Model of Teacher Quality and Student Achievement.

The regression analyses, based on the analytical procedures explained in the data analysis section of Chapter One, were concerned with student learning as measured in academic test scores as a function of school quality variables. The results of the regression analyses are as follows.

1. Preliminary Model

Table 4.1 presents only standardized regression coefficients which were over 0.06. This cut-off point was selected because it exceeded the 95 percent confidence interval for the standard error of sampling.

It must be recognized that this regression includes all schools in all provinces. This was done for the sake of exploring some important variables. Table 4.1 shows that the R square values for each analysis are low. Normally it should be possible to account for over 30 percent of the varience. In order to increase the amount of the explained variance, it is necessary to include more variables that are more strongly associated with achievement.

Having said that, what is of interest in what has been produced by this preliminary model? The two major variables of interest for all three provinces are teacher test score and instructional time, and this is true for all three subject areas. The higher the achievement of the teacher in the subject matter, the more the students learn and the more time the students receive instruction, the more they learn.

The next step of the analysis is to create working files with a greater number of policy and process variables drawn from various questionnaires and to repeat the analyses in the way demonstrated above. In the following model, the Full Model, the number of variables included is larger, based on the conceptual model depicted in Figure 1.1. Independent variables

involved in the next model consist of all types of variables strongly associated with student academic learning, so as to estimate larger variance in achievement accounted for by the variables involved.

Table 4.1

Preliminary Results of Regression Analysis for Three Subject Areas (Standardized Beta)

Independent Variables	Bhs. Indo.	Math.	Science
NON-MALLEABLE			
Urban-Rural	.06	07	—
Respondents Occupation	.10	11	.09
Father Education	.10	.09	.15
Student Sex	—	—	.09
R Squared Non-Malleable (%)	11.4	12.4	11.1
MALLEABLE			
Lighting	07	—	—
Instructional Time in Subject Areas	.08	.11	
Student Days Sick	-.06	—	—
Teacher Days Absent	-.10	-.08	-.06
Teacher Other Job	.09	.11	—
Years Teaching Experience	—	.08	.07
Size of Class 6	.07	.10	.08
Perceived Difficulty Teaching	-.07	—	—
Teacher Test Score	.16	.17	.13
Total R Square	21.8	17.1	16.2

2. Full Model

In the regression equation, only mathematics achievement was chosen as a dependent variable. The independent variables are selected from the list of variables in the second model described in Chapter One. The results of the preliminary model in Table 4.1 shows that the pattern of

school and non-school variables in determining each score of the three subject areas are virtually the same. The pattern is that family and community backgrounds, the non-malleable variables, had stronger effects than those did the school variables. The following regression analysis would not be undertaken in the whole subject areas. The mathematics score was chosen as it shows higher R square than does the Science test.

Table 4.2 shows that the magnitude of variance explained by school quality variables and non-school variables was only slightly different, i.e., 9.66% of the variance was explained by school quality variables, and 11.06% by non-school variables. Home and community variables affecting achievement appeared to be somewhat stronger than the school quality variables. The community variables included in the model are thought of as indicators of rurality of a census block, whereas family variables are indicators of socio-economic variables.

Among the school quality determinants included, teacher quality appears to be the best predictor of mathematics achievement (7.87%). The magnitude of variance explained by teacher quality is much larger than that explained by student characteristics (0.80%) and management quality variables (1.79%). Therefore, the model of teacher quality needs specifically analyzing, as this will explore important teacher variables explaining more strongly the construct of teacher quality – and how the construct of teacher quality is important to student learning relative to other school quality variables.

Teacher professional capacity was measured by how teachers performed on academic tests in mathematics. This variable had the strongest effect on mathematics achievement (Beta=0.206) compared with other teacher variables. The second teacher variable is the professional activities of teachers as the measure of teacher effort (Beta=0.087). This variable was measured in terms of teachers' activities in addition, but related, to their teaching efforts, in this case the amount of reading and discussion with other teachers. Both teacher variables seem to be important, especially in exposing teachers to a number of new experiences which, in turn, may bring insight and new ideas.

Other measures of teacher effort found to be significant were methods of teaching used, such as textbook reading (Beta=0.08), other book reading (Beta=0.05), classroom discussion (Beta=0.06), use of materials (0.07), and classroom demonstration (Beta=-0.047). The amount of instructional time per week also appears to significantly affect the mathematics score (Beta=0.09). These results indicate that the higher achieving students in Mathematics are those who were exposed to a longer instructional time per week; were taught by teachers who have a better

Table 4.2

Determinants of Mathematics Achievement (R Square=0.207*)

Variables Name	Beta Weight	R-Square
I. COVARIATES		
1. % of educated population	.150	
2. Being in Jawa Barat	.096	
3. Wealth of census block	.074	
4. Number of private school	.052	
5. Public facilities	.073	
6. Electricity	.077	
7. Avg. Family income (C.B.)	-.063	
		10.26%
II. STUDENT CHARACTERISTICS		
1. Income of the family	.056	
2. Educational aspiration	.048	
3. Kindergarten attendance	.050	
		0.80%
III. TEACHER QUALITY		
1. Professional Capacity	.206	
2. Amount of reading	.087	
3. Discussion with peers	.081	
4. Teaching efforts:		
a. Textbooks reading	.077	
b. Classroom discussion	.058	
c. Use of materials	.070	
d. Classroom experiment	.047	
5. Instructional hour/week	.086	
		7.87%
IV. MANAGEMENT QUALITY		
1. Age of principal	.052	
2. Classroom equipment	-.044	
3. School facilities	.043	
4. Internal control mgt.	.065	
5. Meeting w/ supervisor	.048	
6. External relations	.045	
		1.79

* $F(27.2834) = 27.44, p < 001$

knowledge of subject content and who are involved in professional activities, such as reading books and peer discussion; and who taught through reading, discussion, use of teaching materials, and classroom practice.

The strongest determinant among the managerial quality variables was the headmaster's activities in establishing an internal control system (Beta=0.065). This derived variable is concerned with what the principal actually did in evaluating and improving the instructional processes carried out by teachers. Conceptually, this variable is related to the other three significant variables, i.e., age of principal, frequency of meeting with supervisor, and external school relations. This means that higher academic performance is associated significantly and positively with a higher degree of external relations, continuous internal control for the improvement of the instructional process, and interaction with school supervisor.

3. Comparative Regression Model

a. Comparison Among Provinces

Table 4.2 shows that structural variables, used as control variables in the analysis, appear to be more important than the school variables in affecting school performance. All seven covariates are likely to vary due to the systematic differences in provinces. For example, being in Jawa Barat shows a very significant effect in predicting achievement. However, province is a variable that appears to be a proxy for unlimited influences and many unknown values and processes that could contribute to the student learning process. Therefore, the effect of province should be controlled in subsequent regression analysis. In the actual analysis, the regression model was applied to each of the three provinces separately. These analyses show an interesting phenomenon of school achievement determinants. The results of the analyses are shown in Table 4.3.

The results of the regression analyses in each province show that the less developed a province is, the higher the variance in mathematics test score explained by non-school variables. It seems to be at odds with the other findings which suggest that the effect of non-school variables should be even stronger in West Jawa as it has been identified as more developed than the other two. But possibly more rural census blocks in West Java have been selected than in South Sulawesi and NTB; this then would be a sampling error.

Table 4.3 indicates that transportation facilities, lighting at home, wealth of the census block, and public facility are societal development variables which were not identified as significant predictors. This does not necessarily mean that those variables are unimportant for educational

Table 4.3

Determinants of Mathematics Achievement: Comparison among Provinces

Variables Name	West Java 0.281 a)	South Sul. 0.328 b)	NTB 0.324c)
I. COVARIATES			
1. N of private schools	.109	—	-.087
2. Electricity	.045	.191	—
3. % of educated population	054	—	.240
4. Transportation facility	—	-.275	—
5. Average family income (C.B.)	—	-.088	—
6. Lighting at home	—	.139	—
7. Wealth of the census block	—	—	.205
8. Public facility	—	—	.163
9. Parent education	.097	—	—
10. Family income			.050
R Square	9.53%	14.83%	16.14%
II. STUDENT CHARACTERISTICS			
1. Educational aspiration	.088	—	—
2. Frequence of tardiness	—	-.078	—
3. Kindergarten attendance	—	—	.099
R Square	0.70%	0.4%	1.0%
III. TEACHER QUALITY			
1. Teacher score in math	.247	.170	.177
2. Structured teaching approach	-.153	-.102	—
3. Professional activities	.058	.157	—
4. Seniority	.060	—	-.088
5. Moonlighting (other jobs)	-.104	-.117	—
6. Teaching efforts:			
a. Textbooks reading	.113	—	.095
b. Other book reading	.107	—	—
c. Use of materials	.099	.122	—
d. Classroom experiments	.073	.117	—
e. Classroom discussions	.066	—	—
7. Instructional hours per week	—	—	.084
R Square	5.63%	7.83%	4.81%

Table 4.3 (continued)

Variables Name	West Java 0.281 a)	South Sul. 0.328 b)	NTB 0.324c)
IV. MANAGEMENT QUALITY			
1. Classroom equipment	-.158	-.120	.121
2. Provision of math textbook	.176	—	—
3. Meeting with supervisor	.117	—	.200
4. Age of principal	—	-.184	.109
5. Years of teaching experience	—	.132	-.165
6. School facilities	—	-.095	.178
7. External relationships	—	.226	.098
8. Internal control mechanism	—	.091	—
9. Meeting with teachers	—	—	.076
R Square	3.20%	8.44%	10.47%

a) F (20,784)=15.33, p < 0.001;
b) F (21,901)=20.93, p < 0.001;
c) F (20,1123)=29.94, p < 0.001

quality. It indicates rather a more homogenous level of development among societies in West Java which produce less variability in the concerned variables. Therefore, this finding does not appear to be a paradox for the findings generated by other international studies.

On the other hand, family income, public facilities, and wealth of census block vary in NTB much more than in West Java. In effect, these later societal variables made differences in achievement in NTB, but not in West Java.

There were also differences in the effect of student characteristics among each province. In West Java, educational aspiration matters much in different'ıting academic achievement which means that the individual students appear to be the locus in determining the progress and quality of their learning (Beta=0.09). This also is supported by the fact that parent education appears to be a significant non-school effect variable that is highly related to the educational aspiration of students. In Sulawesi Selatan, frequency of students' tardiness matters in a negative direction. The frequency of tardiness appears to be a major problem of students' learning in that province. In the three provinces, kindergarten attendance is a strong determinant of achievement, demonstrating the very important

pre-school effect variables as it improves early student motivation and the habit to learn.

Differential effects of school quality variables indicate that teacher quality variables shared larger variance in student achievement than did the management quality variables in West Java. The same is not true for the other two provinces which showed that management quality explained more variation in achievement. The stronger effect of the management quality variables in South Sulawesi and NTB may indicate the potential capability of school management in coping with the overall educational process in a school system, including problems regarding instructional matters. This may not be true for the management factor in West Jawa, since the average size of schools in Java were larger, which affected the headmaster's ability to cope with the complexity. The more powerful effects of teacher quality variables in West Java appear to indicate that teachers in West Java were more independent and had more capacity to learn as they are better equiped than those are in the other provinces.

Having controlled for the effect of provincial variation, this analysis shows as an important phenomena that teacher quality variables remain important in determining differences in achievement. The teacher quality variable that appears to be the single most important effect variable in all the three provinces is the professional capacity of teachers, i.e., teacher test scores. This suggests that the better a teacher has mastered subject content areas, the better his/her students will perform. Teacher capacity, as defined in this study, acts as the basis for teacher overall professional capability, and this is an important issue for the improvement of school quality.

Lecturing did not turn out to be a significant school effect variable. It is the most common teaching method used by teachers. As a matter of fact, the structured teaching approach variable effected achievement negatively (Beta=-0.153 for West Java and -0.102 for South Sulawesi), while other more dynamic teaching approaches, for example, textbook reading, use of materials, classroom demonstration, and discussion, explained more measured achievement differences than did the lecturing method. This also appears to be an important issue to address for school quality improvement in the future.

While provision of Mathematics textbooks explained differences in Mathematics scores in West Java (Beta=0.176), this variable did not demonstrate its significance in the other two provinces. Textbooks in the Javanese schools did matter because shortages of textbooks tend to occur more often as the rate of increase in enrollment exceeds the rate of textbook production. Finally, the profile of the management process was stronger in affecting school achievement outside Java. External manage-

ment relations and internal control mechanisms had an effect on mathematics achievement in South Sulawesi and NTB and therefore these mechanisms need to be used to improve teacher quality through the overall managerial process.

b. Comparison between "Rural-Poor" and "Urban-Wealthy" Student Sub-Sample

The second comparative regression analysis was applied; comparason between "Poor-Rural" and "Urban-Wealthy" student groups on the effect of school quality on student learning. In the regression model, school location (rural-urban) and family socio-economic status (poor versus wealthier student) were held constant. Having classified students in terms of school locations and family SES, there were four groups of students established. However, this analysis has chosen only two extreme groups, the "rural-poor" and the "urban-wealthy" student groups.

The results of the comparative regression model show interesting differences (Tables 4.4 and 4.5). The tables show two interesting prototypes on the effect of school quality on achievement. In the "urban-wealthy" group, the strongest variable is teaching process, which is more student-centered and oriented toward a problem-solving approach (Table 4.5). It is reasonable to say that the quality of teachers, learning facilities, and classroom equipment did not matter any more for the schools of the urban-wealthy group than they did for their rural counterparts. No school facilities were found to affect achievement significantly since the school provisions for the urban-wealthy schools were almost sufficiently standardized. Students in the urban-wealthy schools may need more exposure to information than those in the rural-poor group to find solutions and to apply critical thinking.

In the "rural-poor" schools, on the other hand, the strongest process variables affecting achievement were those which are identified as "structured instructional process". The variables are classroom exercise, remedial teaching, and longer instructional time (Table 4.4). This indicates that this type of teaching process still needs to be supported by school provisions, i.e., textbooks, exercise books, classroom equipment, and teacher guidebooks. Table 4.4 shows that classroom equipment and textbooks still have a strong effect on achievement.

Provision of learning facilities is found to be a strong determinant for students in rural-poor schools. However, this also means that boosting achievement only through provision of resources is limited by the ability to carry out this strategy. Students in the rural-poor group will not reach the level of their urban-wealthy counterparts in academic testing, at least until equal resources are provided. Therefore, providing sufficient resources (teacher, learning aids, textbooks, etc.) is the essential first step in

improving achievement before going further to the development of critical thinking and problem solving.

Table 4.4

Determinants of Student Achievement in Mathematics for the "Rural-Poor" Student Sub-Sample

Predictor of Achievement	Beta weight	R-Square
1. Student Variables		
Educational aspiration	.158**	0.0602
Modernity scale	.123**	0.0446
Kindergarten attendance	.086*	0.0129
2. Managerial Inputs		
Learning aids	.118**	0.0177
Textbooks	.088*	0.0098
Age of headmaster	-.064*	0.0050
3. Managerial Processes		
School mtg. w/ parents on curriculum	.127**	0.0204
School meeting w/ parentson school plan & budget	-.091*	0.0093
Freq. school meeting on student progress	.103*	0.0100
4. Teacher Quality		
Teacher score in math	.108**	0.0145
5. Instructional Processes		
Instructional time/week	.124**	0.0307
Use of textbooks	.140**	0.0245
Library reading assignments	.095*	0.0114
Teaching individual remedial	.078*	0.0137
Student grouping	.072*	0.0062
Classroom exercises	.069*	0.0059
R Square		0.2970

Table 4.5

Determinants of Mathematics Achievement for the "Urban-Wealthy" Sub-sample

Variable Betas	Beta weight	R-Square
1. Home Background		
Parental help for student	-.059*	0.0071
2. Student Variables		
Modernity scales	.170**	0.0939
Kindergarten attendance	.113**	0.0385
Educational aspiration	.093**	0.0209
Frequency of tardiness	- .075**	0.0117
3. Instructional Variables		
Problem solving methods	.116**	0.0331
Home reading assignments	.085**	0.0174
R Square		0.2230

Based on the above findings, quality improvement efforts for poor students in rural schools should first be directed toward providing the optimal level of educational facilities. Whereas boosting achievement for students in the urban-wealthy areas can start with improvement of the instructional process characterized by student-centered approaches, for example, problem solving methodologies or active learning approaches.

4. Teacher Quality Model

Building a model of teacher quality was undertaken to explore other teacher quality variables which affect student academic achievement than was possible by the previous models. The amount of explainable variance in student achievement due to teachers variables is not as high as that explained by overall school quality variables, since this model is naturally a reduced model of school quality. In applying this model, a number of teacher variables that are strongly associated with student achievement, as well as with teacher scores, were included in the model.

Two regression analyses were undertaken under this model. The first analyzed the effect of teacher variables on student academic achievement in three subject areas (Table 4.6). The second analyzed the effect of school

quality variables on teacher scores, which appear to be the strongest determinant of student achievement (Table 4.7).

Table 4.6

Teacher Quality as Determinants of Student Achievement n Three Subject Areas

Teacher Variables / R Squares	Math. (0.156)	Science (0.149)	B. Indo (0.138)
1. Problem solving method	0.15	0.16	0.20
2. School recreation	0.15	0.13	0.12
3. Teacher score in related subject	0.21	0.20	0.32
4. Add. teaching hours	0.14	0.17	—
5. Classroom exercise	0.13	—	—
6. Discussion among teachers	0.15	0.10	0.13
7. Learning outside the classroom	—	0.21	—
8. Sex of teacher	—	0.17	—
9. Make teaching preparation (lesson plan)	—	(0.12)	—
10. Teacher income	—	0.10	—
11. Reading textbook	—	—	0.18
12. Group discussion	—	—	0.14

The amount of variance in student academic scores for each subject area explained by teacher variables is lower than that explained by the full model (see Table 4.6 as compared to Table 4.2 and Table 4.3).

As shown in Table 4.6, teacher variables strongly related to student scores can be identified as two types; those which are common to all subjects and those which are subject specific. Consistent with the previous findings, the three out of four common variables which strongly determine variance in test scores for the three subjects are teacher scores, frequent use of problem solving method in teaching, and frequent discussion among teachers. These teacher variables are important because they are indicators of teacher learning capacity. This finding would indicate that better student scores in academic testing were closely associated with the higher capacity of teachers to learn, alone as well as through discussion with his/her peers.

Table 4.7

Determinants of Teacher Scores in Three Subject Areas

R Squares	Mathematics (0.3141)	Science (0.2992)	Bhs. Indo. (0.2341)
1. Employment status	(0.14)	—	—
2. Discussions among teachers	0.18	0.17	0.14
3. Years of teaching	0.18	—	0.49
4. Add. teaching hours	(0.14)	0.13	—
5. Amount of teacher reading activities	0.15	0.19	0.33
6. Education Background	0.13	0.14	0.19
7. In-service training attended	0.13	—	—
8. Corrects homework	—	0.19	—
9. Makes lesson plan	—	(0.15)	
10. Group discussions	—	—	(0.17)
11. Teacher income	—	—	0.17
12. Age of teacher	—	(0.21)	(0.59)

There are several subject specific variables which are related to student academic achievement. Classroom exercise and additional teaching hours are specific determinants of Mathematics achievement, but do not affect Bahasa Indonesia scores significantly. Group discussion is a strong determinant for Bahasa Indonesia scores, but does affect significantly the other two subjects. Variables that explain significant variance only in Science scores are: sex of teacher, teacher income, making lesson plans or teacher preparation, and reading textbooks. The first three variables are science-specific and are not easily manipulated by educational policy.

An interesting finding here is the effect of classroom exercise and additional teaching hours on Mathematics achievement. This is an interesting issue in boosting Mathematics achievement. Mathematics testing that mostly consists of arithmetic test items, in fact, benefited from instructional time and classroom exercise more than did the other two

subjects. The variables were not as important in Science, for which reading textbooks appeared to be effective for improving scores. This suggests that differential strategies should be undertaken to boost achievement in different subject areas in order to achieve higher school capacity to improve academic achievement.

Another interesting issue in this analysis is the negative Beta Weight of the teacher variable "makes lesson plan". This variable did not appear to affect achievement negatively. This may indicate that lesson preparation is a task that may not interest many teachers, and that it may have even discouraged teachers from developing their capacity to learn. This variable also affected teacher scores negatively as shown in Table 4.7. A variable that has encouraged teachers to master their knowledge is "teacher reading activities" which appears to be another form of teaching preparation (Table 4.7).

As was found in the previous model, teacher capacity to learn appears to be the most important teacher quality measure in this study. Teacher capacity itself was measured in this study in terms of teacher mastery of subject content as shown in the scores of subject matter tests. It is assumed that teacher mastery of subject content is a sound measure of teacher quality as compared to other teacher variables, such as educational background or in-service training. Teacher capacity to learn should be determined by teacher's professional efforts, as well as school management variables in the context of strengthening professional capacity. Table 4.7 shows variables that significantly affect teacher scores in the three subject areas.

Four common variables account for significant effects on the scores in three subjects, i.e., amount of reading books, educational background, frequent discussion among teachers, years of teaching (only important in Math and Language). These variables are important for improvement of teacher mastery of subject content as they are related to improving teacher capacity to learn. This means that teacher mastery of subject content is associated with reading books, higher education level, more frequent discussion with peers, and more years of teaching.

5. Conclusions

A number of issues related to findings of the regression analyses in chapter four are discussed below.

a. This analysis of school quality and academic achievement generally shows that, based on the models developed for this study, home background and community variables consistently explained academic achievement more powerfully than did the school quality variables. This has changed since the finding of the school study conducted in 1976.

b. The two strongest school quality variables affecting academic achievement are teacher test scores in related subject matter and instructional time. This indicates that the more a teacher masters subject content, and the more time a teacher devotes to instruction, the more students learn. This finding is consistent throughout the models employed in the analyses.

c. Among the school quality determinants included, teacher quality appears to be the best predictor of Mathematics achievement. The magnitude of variance explained by teacher quality variables is much larger than that explained by student characteristics and management quality variables. Among the set of teacher variables analyzed, teacher professional capacity, measured by how teachers have performed on academic tests, appears to be the strongest determinant of student achievement.

d. Other teacher quality variables strongly affecting Mathematics testing are teacher professional activities and teaching strategies. The finding of the Full Model indicates that the higher achieving students in Mathematics are those who were exposed to more instructional hours per week; were taught by teachers with a better knowledge of subject content and who were involved in professional activities, such as reading books and peer discussion; and who were taught through reading, discussion, use of teaching materials, and other classroom practices.

e. A number of managerial variables were found to be associated significantly with achievement. The findings suggest that higher academic performance is associated significantly and positively with a higher degree of external school relations (attending PTA meetings, comparisons with other schools, and interaction with student's parents); continuous mechanisms of internal control for the improvement of the instructional process (classrooms supervised by headmaster, headmaster correcting lesson plans, etc.); and discussion and interaction with school supervisor.

f. Having controlled for the effect of province, this analysis shows the important phenomenon that teacher test scores in related subjects remains important in affecting differences in student achievement. This indicates that teacher mastery of subject content is the single most important effect variable in each of the three provinces.

g. Lecturing is not shown to be a significant process variable. It is the most common teaching method used by teachers. The study suggests that lecturing and the structured teaching approach affect student achievement negatively. On the other hand, the more dynamic teaching approaches, for example, textbook reading, use of materials, classroom demonstration, and discussion, affected achievement positively.

h. While provision of Mathematics textbooks explained differences in Mathematic scores in West Java (Beta=0.176), this variable did not demonstrate its significance in the other two provinces. Textbooks in the

Javanese schools mattered because problems of textbooks insufficiency exist more often when the rate of increase in enrollment exceeds the rate of increase in textbook production.

i. The profile of management process was stronger in affecting school achievement outside Java. External management relations and internal control mechanisms affected Mathematics scores more powerfully in South Sulawesi and NTB. Therefore, these mechanisms need to be used for improving teacher quality through the overall managerial process, especially outside Java.

j. In the "urban-wealthy" group, the strongest variable is teaching processes which are student-centered and oriented toward a problem solving approach. In the "rural-poor" schools, on the other hand, the strongest process variables affecting achievement were those which are identified as "structured instructional processes", such as classroom exercises, remedial teaching, and longer instructional time. This indicates that this type of teaching process still needs to be supported by adequate school provisions, i.e., textbooks, exercise books, classroom equipment, and teacher guidebooks. Many rural-poor schools may be not yet provided with sufficient resources.

k. An interesting issue shown in this analysis is the negative Beta Weight of the teacher variable "makes lesson plan". This variable did not appear to affect achievement negatively. This may indicate that lesson preparation is a task that may not interest teachers, and has perhaps even discouraged teachers from developing the capacity to learn. This variable also affected teacher test scores negatively (Table 4.7). A variable that instead encouraged teachers to master subject content knowledge is teacher reading activities, which may be seen as another form of teaching preparation.

CHAPTER 5

Conclusion and Recommendations

1. Major Conclusions

This study investigated the quality of basic education in Indonesia in a *rather comprehensive* way. Employing analytical procedures, the study attempted to examine basic problems and issues related to basic education. The term quality in this study refers to the conception of efficiency of basic education which is assumed to be a "public good" since it naturally is needed by all members of society. Therefore, quality of basic education was examined in terms of effectiveness, equality, and equity of educational opportunity, and the internal efficiency of the education system.

Overall data from the census block questionnaire presents the picture of an overwhelmingly rural society, with families working the fields and receiving relatively few services. Even clean water is a problem for some and inadequate toilet conditions a problem for many. This is the context of Indonesian basic education, where schools are operated and where children learn. The geographic complexity of the Indonesian primary school system requires the comprehensive examination of many basic issues and problems related to improving educational quality. This means that policy makers examining issues in improving the quality of Indonesian basic education must go well beyond the existence of the educational system in the school classroom.

Many problems related to basic education and issues related to educational quality have been examined in this study. These problems and issues are discussed below.

Basic Issues

Educational Access. The participation rate of basic education in Indonesia is extraordinarily high. By 1987, the net enrollment ratio was reported as exceeding 96.5 percent for the 7-12 year-old group and 94 percent for the 6 to 12 year-old group of children. The provision of basic educational opportunity, however, has been concentrated on one dominant delivery system, the regular primary school, (sekolah dasar or SD). In Indonesia, the proportion of SD students is about 90 percent, although this varies from one province to another. The data show that the Madrasah Ibtidaiyah increasingly has played a role in absorbing 7-12 year-old children, up to ten percent of enrollment.

However, the proportion of 6-12 year-old children who have not gained access to school appears to be substantial. The percentage of this

age group is 8.3 percent in West Java, 6.0 percent in South Sulawesi, and 9.0 percent in West Nusa Tenggara (NTB). In the total population, the estimated number of children in this group would be 850 thousand in West Java, 200 thousand in South Sulawesi, and 90 thousand in West Nusa Tenggara. These are significant numbers. Therefore, increasing the enrollment ratio in the more populated provinces would be much more complex than doing so in the less populated ones. The more densely populated a province is; the larger the number of children aged 6 and 7 years to be absorbed will be, and the greater the amount of school facilities to be provided will be.

A significant change in the dominant age of the first grade cohort in Indonesia's primary education system was shown in this study. The change is from 7 to 6 year-old dominant groups of first graders. The data collected in 1987 and in 1990 show that the proportion of 6 year-old children enrolled in primary school has increased substantially, from 26.4 percent in 1987 to 40.5 percent in 1990.

Internal Efficiency. The high enrollment ratio would not necessarily reflect a real opportunity to learn, unless the education system itself is internally efficient. The time series data show that dropout and repetition rates have not declined significantly during the last ten years. The national dropout and repetition rates also have not declined during at least the last 10 years. The analysis of internal efficiency shows that the Input-Output Ratio of the primary school is substantially low, i.e., about 70 percent. This means that the index of school attrition was not less than 30 percent. The considerably high rate of repetition indicates that students who would be expected to complete schooling within 6 years, are actually requiring on average 8.58 years, or 1.5 times longer than the intended schedule.

Equity And Equality. Kindergarten attendance and rural- urban location appear to be indicators of the socio-economic status (SES) of a student's family, Both variables are related significantly to student learning. Most students from higher SES families attended pre-school programs and enrolled in private-urban schools. This would suggest that the quality of basic education, in terms of the level of quality of entering students, differs substantially due to differences in school location and parental socio-economic status. The percentage of females enrolled in primary schools is significantly and consistently lower than their male counterparts. This indicates that the opportunity for access to primary education still appears to be greater for male more than for female children.

It is generally concluded from the analysis that the services of higher quality basic education in Indonesia have tended to be biased toward

students from urban families, wealthy families, male students (especially for school access), and the schools in Java.

Problems of Quality of Basic Education. This study found that basic education in Indonesia confronts profound problems in teacher quality. Teacher quality, as measured in terms of mastery of the subject areas, was observed to be extremely low. The teachers' average score on the Mathematics test was 34.3 out of 58 test items The highest score was in Bahasa Indonesia, while the lowest average score was in Science. The teachers sampled from West Java performed better than did the teachers from the other two provinces. Those from South Sulawesi performed at the lowest level.

The second major problem was the insufficient provision of educational resources, and this varies a great deal among provinces. Schools in West Java generally are better equipped than those are in the other two provinces. There are more schools in West Java equipped with sufficient teacher rooms, libraries, laboratories, and cafeterias. The percentage of schools provided with sufficient numbers of textbooks was practically the same for each of the three provinces. However, there are more schools in West Java which have sufficient textbooks than are those in the other two provinces. The data indicate that the further the province is from Jakarta, the less likely it is to be equipped with adequate school facilities and textbooks.

The third major problem concerned school management quality. This study observes that the management of primary schools is characterized by modest internal control systems as well as external management relations. The internal control mechanisms, examined in this study were Principal activities in evaluating, observing, correcting, and improving the routine activities of a school system. Whereas the "external management relations" were comparative studies with other schools, attending outside meetings, and discussions of school planning with Sub-District Officers. Both managerial activities do not appear to be fully developed as yet in the Indonesian school system, as most schools reported that they have not engaged in these types of activities.

Disparity in Student Achievement

This study generally observed a low level of student academic achievement as seen in terms of percentage of correct answers from the number of items in three subject areas tested. This level of mastery was virtually the same as the one measured in the previous Grade Sixth Survey 13 years ago (Moegiadi, 1976). In comparison with the 1976 study, there seems to be more difficulty faced by students in mastering Mathematics than the other two subject areas. The difficulty has been increasing lately.

In terms of percentage of correct answers, the average scores measured in this study are better in Bahasa Indonesia, better in Science, but much worse in Mathematics than the ones measured in the 1976 study.

The observed disparity of achievement found in this study is first due to provincial differences. In all the three subject areas, Mathematics, Science and Bahasa Indonesia, students in West Java performed better than did students in South Sulawesi and NTB. The difference of achievement between West Java and NTB is one-third of a standard deviation in Mathematics, and one-half a standard deviation in both Science and Bahasa Indonesia.

Considerable differences in achievement also were observed due to the random effect variables, such as rural-urban and family socio-economic status. This has been consistently observed since the achievement study conducted in 1976. This study observed that students in urban areas performed on Mathematics tests one-half of a standard deviation better than did students in rural areas, and the same held true for the other two subjects. The average academic achievement also differs by levels of family socio-economic status. The higher average scores of academic achievement in three subject areas tend to be associated with speaking more Bahasa Indonesia at home, higher parental education, higher family income, and better home lighting.

Finally, differences in average student achievement are also a function of school quality variables. It is assumed that variations in achievement due to differences in provinces and rural-urban location should be associated with differences in school quality by measures of appropriate school provisions. South Sulawesi and NTB have more isolated schools than West Java as they are confronted with more difficult geographical problems in providing educational resources equally to schools. More schools in rural areas are inadequately provided with school facilities, classroom equipment and textbooks, than are schools in urban areas.

School Quality as Determinants of Achievement

The results of multiple regression analysis indicate that home and community variables affected variation in achievement somewhat stronger than did the school quality variables. The community variables included in the model are indicators of level of rurality of a census block, whereas home background variables are indicators of the socio-economic status of a student's family. A shift in larger variance accounted for by home and community background has begun to emerge, as compared to the study conducted in 1976. The 1976 study by Moegiadi found that

school variables had a greater effect on achievement than did non-school variables.

International studies generally indicate that the more developed a society is, the stronger the effect of non-school variables. The change reported in this study indicates that Indonesian society has come to a turning point in the journey towards a more developed society, with family and societal background beginning to affect achievement more than school variables. The point made here is that the effects of home and community in education have increasingly emerged as significant, and this has to be taken into account in quality improvement policy for basic education.

Regression analyses were undertaken based on several models. The preliminary and full model show that structural variables, used as control variables in the analysis, appear to be important, even more important than school variables, in affecting school performance. Variations in students' academic achievement affected by province, school geographical locations, and socioeconomic status of students' families appear to be interesting. It is interesting also that these are not policy manipulable variables. Therefore, the existence of achievement variation due to differences in province, rural-urban location, and socioeconomic status are random effects which educational policy may not be able to manipulate. This means that the gaps in student academic achievement that exist among provinces and between geographical locations are structural in nature.

Nevertheless, province, school location, and the socio-economic status of students' families are variables that might also appear to be proxies of values and processes that strongly influence student learning. These are not easily identified, however, through studies of this kind. In order to reduce uncertainty, it is necessary to further investigate what process variables or values happen to be in variance among provinces and between rural-urban locations that might lead to differences in student academic achievement. Subsequent regression models then examined school quality variables as determinants of student achievement when the three random variables were held constant.

Major conclusions of this study concerning the determinants of student achievement are as follows.

(1) It appears that teacher quality and the length of instructional time in each subject are the strongest policy manipulable predictors of student achievement. Teachers' scores on subject content tests turns out to be most positively related to student achievement. This teacher professional capacity variable is the strongest, not only among the teacher quality variables, but also among all school quality variables included in the

models. Other teacher quality variables which strongly affected achievement are teacher professional activities and some teaching strategies. Generally, this indicates that the higher achieving students are those who received more instructional time per week; who were taught by teachers who have a better knowledge of subject content and were involved in professional activities, such as reading books and peer discussion; and who were taught through reading, use of teaching materials, discussions, and classroom exercises.

(2) A number of managerial variables were found to be associated significantly with achievement. The data analyses indicated that higher academic performance is associated significantly and positively with a higher degree of external school relations (attending PTA meetings, comparative studies with other school, and interaction with student parents); continuous mechanisms of internal control for the improvement of the instructional process (classroom supervised by headmaster, headmaster correcting lesson plans, etc.); and discussions or interaction with school supervisor.

(3) Teaching process variables have also been shown to be determinations of achievement. Lecturing appears to be the common teaching method used by most teachers. However, it is a positive process variable. This study found that lecturing, a structured teaching approach, affected student achievement negatively. On the other hand, more dynamic teaching approaches, such as textbook reading, use of materials, classroom demonstrations, discussions and problem solving methods affected achievement positively.

(4) An interesting finding concerns classroom exercises and additional teaching hours for Mathematics; interesting issues in boosting Mathematics achievement. Mathematics testing that consists mostly of arithmetic test items, in fact, appears to require longer instructional time and more classroom exercises in order for students to achieve better test score. The same does not appear to be true, however, for science, for which reading text books appeared to be strongly related to improving test scores. This suggests that differential strategies should be undertaken in boosting achievement in different subject areas, in order to strengthen school capacity to improve student academic achievement in all areas.

(5) Another interesting issue highlighted in this analysis is the negative Beta Weight of the teacher variable "preparation of lesson plans." The analysis revealed that this did not appear to affect student achievement negatively. This may indicate that lesson preparation is not a task that interests teachers, and that perhaps this even had discouraged teachers from enriching their capacity to learn. This variable was shown to affect teacher subject area scores negatively. On the other hand, a variable that

instead encouraged teachers to master their subject area knowledge was "teacher reading activities," which might be seen as another form of teaching preparation.

The comparative regression model among the study provinces produced the following conclusions.

(1) While provision of Mathematics textbooks explained differences in Mathematics scores in West Java (Beta=0.176), this variable was not significant in the other two provinces. Textbooks in the Javanese schools did significantly affect achievement, perhaps because problems of textbooks insufficiency tend to exist inevitably when the rate of enrollment exceeds the rate of textbook production.

(2) The profile of management processes was found to be stronger in affecting school achievement outside Java. External management relations and internal control mechanisms affected Mathematics score more powerfully in South Sulawesi and NTB. These mechanisms, therefore, need to be aimed at improving teacher quality through the overall managerial process, especially outside Java.

Comparison between the "rural-poor" and the "urban-wealthy" student groups as regards school quality determinants of student achievement generally shows the following conclusions.

(1) There is no significant difference between the two groups of students as to the relative effect of student characteristics variables as measured by attitudinal, educational, and aspirational characteristics. This suggests that the student quality measures in this study are strong determinants of achievements even though their association to achievement has been controlled for in the regression analysis.

Provision of learning facilities was found to be a strong determinant of student achievement in rural-poor schools. However, it also suggests that boosting achievement through the provision of resources will be a limited strategy. Students in the rural-poor group, through this strategy, would not reach the capacity of their urban-wealthy counterparts in performing academic testing until resources were equally provided. Therefore, providing sufficient resources (teachers, learning aids, textbooks, etc.) appears to be the essential first step towards improving achievement before the development of critical thinking and problem solving skills. Based on the above findings, quality improvement endeavors for poor students in rural schools should be directed first towards providing the optimal level of educational facilities. Whereas boosting achievement for students in the urban-wealthy areas can start with improvement of the instructional process, characterized by student-centered teaching processes; for example, problem solving methodologies or active learning approaches.

(3) As shown in the previous conclusions, teacher quality variables appear to be the strongest determinants of student achievement, even compared to overall school quality variables. Among the teacher quality variables, teacher mastery of subject content is the strongest. This finding was consistently observed throughout all the models of regression analyses. Teacher mastery of related subject content by itself is affected by professional activities, such as frequently reading books, discussions with peers, and frequent use of dynamic methods of instruction.

2. Policy Issues to be Addressed

This study found that the average student achievement varies significantly by school location (rural-urban) and socio-economic status of students' families. It was found consistently that students from the urban schools and higher socio-economic status families performed much better academically. At the other end of the scale, schools of students from rural and lower socio-economic status families have been confronted with a lack of teachers, materials, textbooks, and other classroom equipment. Those schools have tried to serve the most disadvantaged students whose academic achievement was the lowest on average. In general, both groups of schools operate at different stages of development; most of the rural schools serve students from the lowest socio-economic status families and could be identified as schools at the initial stage of development.

Urban rich families appears to be proxies of differences in values and life styles among student's families associated with the intensity of student learning experiences. Albeit important, the values and life styles of a student's family which seem to influence the amount of student learning may not easily be identifiable. However, a definitive answer as to why the "urban" and "rich" status of a student's family affect higher achievement may not be necessary. Family socio-economic status and geographical location are variables that are not manipulable in nature. What seems to be important, rather, is to account for some malleable variables, especially the process variables whenever family SES and geographical location are held constant. Family SES and location then are assumed to be given contexts or constraints in which a school system operates. Production of academic achievement varies significantly associated with differences in this context. This is how this study has taken the contextual factors into account, especially in formulating policy recommendations for quality improvement in basic education.

Important policy issues dealing with primary educational quality improvement are discussed below.

Improvement of Textbook Quality and Distribution

This study has provided further evidence for the importance of textbooks in differentiating the average levels of student achievement as had been identified by previous studies in developing countries (Heyneman & Loxley, 1981; Bruce Fuller, 1985). This study observed that the use of textbooks in instructional processes appears to be important to boost achievement of students in both rural and urban schools.

However, two major problems should be taken into account pertinent to the issues of textbooks; that is, the quality and the distribution of textbooks.

First, concerning the low effect of textbooks on achievement, the World Bank (1989) found that in the Sixth Grade Achievement Survey (Moegiadi, 1976), textbooks were not sufficiently available and utilized, nor they were appropriate in content. Therefore, the provision of textbooks was not significant for boosting achievement. The Policy Analysis Group's Policy Papers (1988) emphasized that contents of the textbooks too "inward looking." The present textbooks generally contain theoretical concepts that do not enable students to deal with real environmental problems while they undertake school learning. From a different point of view, the World Bank Basic Education Study (1989) reported that the low quality of textbooks was due to frequent changes of the school curriculum that led to outdated textbooks. Lack of coordination between the Center for Curriculum and the Center for Textbooks in recruiting and training textbook authors is encountered frequently and appears to be a cause of textbooks quality problems.

The contents of school textbooks are intended to be "outward looking"; they should not be overly concerned with theoretical concepts, but should encourage students to engage in understanding real environmental problems and their solutions which are associated with the concepts presented in the textbooks. Therefore, the roles of subject matter specialists, curriculum developers, textbook organizers, and testing specialists require close coordination, especially for the concerned textbooks authors. Authors should be regularly trained to produce the textbooks most needed for the implementation of the current curriculum, including private publishers who produce both required and enrichment textbooks.

Second, the provision of textbooks to schools does not appear to be a simple task. Textbook provision starts with acquisition, editing, reproduction, publication, allocation, storing, maintenance, and distribution of textbooks to schools. This is a long, difficult and complex task. The time required to carry out the whole process is on average four years, beginning with the writing of the first line of the textbooks, up to the moment when

the books are provided to schools (Taya Paembonan, 1988). This means that problems of outdating and unequal distribution inherent throughout the process of textbook provision.

In Indonesia by 1980, there were about 300 million textbooks being distributed to schools. In fact, however, the books were inequitably provided to schools. This study observed that 30.2 percent of the schools in Indonesia were not provided textbooks at all; another 11.2 percent were not sufficiently provided with textbooks. Only 58.3 percent of schools reported that they were provided sufficiently. In rural areas, only 56.8 percent of schools were provided with sufficient textbooks.

The study suggests that the present mechanism of resources provision will lead to the reproduction of millions of textbooks in Jakarta and distribution directly to the hundreds of thousands of schools spread unevenly throughout Indonesia. It is not easy to provide textbooks equally to individual schools throughout Indonesia directly from the central government. Equality of textbook provision could be improved if some of the central government responsibilities were delegated to the provincial and local government levels. By this strategy, textbooks acquired and developed by the central staffs would be reproduced and redistributed by the corresponding local staffs. The role of the central government is to provide intensive supervision and guidance in this process.

This strategy is important to enhance the possibility that books are equally provided to schools, with control by the central government reduced and shortened, and thereby improving supervision for textbook distribution. Other important benefits of decentralizing textbooks provision would be to reduce distribution costs from Jakarta to each of the provincial capitals, to improve capability of the provincial and local staffs in managing and supervising textbooks distribution system, and, finally, to mobilize and strengthen local private publishers for reproduction and distribution.

However, the lack of textbooks confronting primary schools in Indonesia is not due solely to technical factors. Equality of textbooks provision may not be achieved unless special attention is paid to schools with disadvantaged students, such as those from rural-remote areas and the economically handicapped. Therefore, special commitments should be made by those affecting the primary school system, i.e., researchers, planners, and policy makers, aimed at prioritizing textbook distribution to the neediest schools.

In conclusion, equality of textbook provision may be achieved by employing the following dual strategy of textbook distribution: (1) deconcentrating and delegating some of the central government's responsibilities to local staffs for the reproduction and distribution of

textbooks to rural schools, and (2) mobilizing private enterprises through the use of market mechanisms for textbook provision, especially for the schools in urban areas. However, for maintaining textbook quality and national unity, the central government still needs to provide sufficient control of the contents of textbooks.

Improving Teacher Quality

Improving the quality of teachers through strengthening teacher training institutions is the long term plan of the government. This has begun from the beginning of Repelita V period. At the same time, the institutional development of teacher training will be aimed at improving the whole planning mechanism for teachers, such as pre-service training, in-service training, recruitment and placement, and career and benefits development for teachers. Of those issues, the building of a mechanism for sustainable on-the-job teacher training appears to be the most challenging and high priority task for the improvement of educational quality.

This study observed that teacher quality appears to be the most strategic path to improving primary educational quality. Teacher quality variables have been observed to consistently affect student academic achievement, especially those related to the way a teacher leads student learning while involving students in analyzing environmental problems and their solutions. The amount of student learning in and out of the school classroom has been found to be determined by the extent to which a teacher has prepared the lesson. Lesson preparation does not mean only whether or not a teacher has made a written preparation (a unit lesson plan), but rather means more broadly how well a teacher has mastered subject content areas and has read books in the area.

Teacher quality appears to be a debatable issue. Quality is measured in this study in terms of teacher professional and motivational characteristics, as well as time devoted to in instructional activities. Teacher professional capacity is measured in terms of mastery of subject content areas and endeavor to continuously update knowledge through reading and discussion with peers. Therefore, improving teacher capacity in mastering subject areas should be among the most urgent policy tasks. Improvement of teacher quality should not be undertaken solely through short in-service teacher training, but rather through mechanisms for developing a school atmosphere conducive to teacher learning and professional activities, such as subject area reading and peer discussion. This process of teacher professional development should evolve toward a sustainable program of quality improvement.

Improvement of Management and Instructional Quality

School management quality appears to be one of the most important factors affecting student learning. School management quality variables most significantly affecting achievement are school provisions (adequate textbooks and materials), internal control mechanisms (such as checking teacher lesson preparation, observing teaching process, and guiding teacher activities), and external management relations (such as attending PTA meeting, comparative studies with other schools, and discussion with sub-district officer in making school annual plans).

The most important school management quality variables are those which are directly related to enhancing learning support systems to enable individual students and teachers to learn more appropriately. Management variables that are strictly administrative (e.g., frequent school meetings on school budget and data collection) in fact affected student learning negatively. It makes sense that school principals who are busy with their administrative chores would not be able to use their time facilitating and supporting learning activities in the schools they manage. This is not to say that administrative tasks are unimportant, but the tasks should be responsibly done by designated staff, such as a Vice Principal. Having been assisted by a designated staff, a school principal may be able to concentrate his or her time on creating a school climate conducive to sustainable learning.

Schools would not be made significantly improved in quality and productivity only by providing them with adequate textbooks and materials. School provisions by themselves will not be effective unless they can be utilized and managed efficiently. Therefore, school material provisions are a very important minimum requirement for quality improvement, before going further to the creation of more dynamic teaching and learning climates in the school system.

This study observed a number of important instructional quality variables which strongly affected student achievement; variables that accounted for significant amount of student learning. The results of the analyses show that achievement is associated with the frequent use of problem solving approaches of teaching, more time for student reading of books, more use of instructional time per week, less student absenteeism and tardiness, adequate textbooks, and more homework and frequent correction.

An effective instructional process may not be created merely by providing teachers who have mastered subject content areas and teaching methods; teacher capability for facilitating student learning activities is required as well. Mastery of subject content and knowledge of teaching

methods are a necessary, but not sufficient, means for a teacher to provide effective instruction. An effective teacher should enable students to become involved in many kinds of learning activities and to absorb new knowledge and procedures from a number of sources, such as continuous reading, writing activities, classroom exercises, and group work. Motivated teachers who can teach with the respect of the education profession will be needed.

In order to manage extended learning activities for students (e.g., problem solving approaches) a flexible school curriculum will be required. A flexible curriculum does not have to be all "open-ended," but helps students and teachers open their minds and feelings to ensure that learning takes place in a broader sense, i.e., learning does not take place only in a school classroom from a single source, but comes from a number of related sources. Learning in this broader sense would lead students to learn from society in which many resources are available for learning activities; teachers, peers, textbooks, other books and reading materials, parents, the natural environment, and so forth. The role of the curriculum is to guide students to select and seek out relevant sources with respect to the stated curricular objectives.

It is important to take a closer look at the emerging conception of the Student Active Learning Approach to teaching currently undertaken in some of the schools. The concept of Student Active Learning is consistent with the education process in Indonesia, since we aim essentially to promote student learning. However, it is not likely that teaching processes can be completely standardized as the instructional process appears naturally to be an art. One important thing to note is that the higher the quality of instruction, the more likely it is to lead to more and better student learning. What would be standardized in the curriculum is the minimal competence a student should acquire from the process of learning and instruction.

Pre-investment in Human Capital

It has been reported in many studies, in both less developed and more developed countries, that the lower achievement of students from poorer families and from rural areas is affected by the low quality of their non-school environments in general and the low quality of their physical surroundings in particular (Simon, 1980). This study observed that the average achievement of students from poorer families was one-half a standard deviation lower than that of those from wealthier ones. Family SES appears to be a non-malleable variable which is not easily manipulated by educational policy. The suggestion of Selowsky (1976) for the improvement of primary quality in developing countries may be worth

considering in the Indonesian case; investment in human capital through pre-school education. Investing in pre-school education may be one of the most important ways to improve the quality of student intake.

The above suggestion is based primarily upon the finding of this study that pre-school student experiences, such as kindergarten attendance and educational aspiration, appear to be one of the strongest determinants of the measured school learning. The study of Moegiadi (1976) also observed that higher quality nutrition of the entering child affects student achievement powerfully. Therefore, it is worth considering the development of pre-school programs, such as kindergarten, play groups, or American-type "Head Start" programs in which children are exposed to early learning experiences, provided with nutritious foods, and motivated to raise their educational aspirations.

In order to develop and assist these programs private educational institutions may have to be mobilized, with the government providing subsidies and acting as facilitator. Through mobilizing private institutions in developing and expanding pre-school education programs, a school-boarding program might be tried in some of the pre-school institutions; especially for those from higher SES families in urban and in rural areas as well.

3. Quality Improvement Strategy

Indonesia faces the challenge of improving the national education system, including the primary education system. Lockheed (1992) suggests that education systems evolves in stages, i.e.:

(1) *Formalism*; initially, schools function with untrained staff and with narrow subject content. This is followed by a rigid and ordered stage of formalism, characterized by trained, but poorly educated teachers,

(2) *Transition*; following the stage of formalism is a stage of transition in which schools are staffed by better trained teachers with more flexibility, and

(3) *Meaning*; a final stage in which teaching methods foster problem-solving skills and promote creativity while catering to the individual differences of students.

The discrepancy between school practices and those that teach higher-order thinking skills is greatest in schools at the first level; The discrepancy decreases at each subsequent level.

Effective educational quality improvement strategies must build gradually on existing strengths, which differ across segments of society. The diverse Indonesian society is characterized by varying stages of societal development. The great numbers of primary schools in Indonesia

are also characterized by varying levels of quality. This requires employing a policy strategy of multi-dimensional stages for school quality improvement, corresponding to each level of societal development within which a primary school operates.

In Indonesia, it would be neither useful nor efficient to suggest that all schools follow the same treatment for the improvement of school quality. Across the great diversity of our country, individual schools are characterized by many different levels of development. Many schools may be identified as at the initial stage, facing the challenge to reach the first stage, the stage of formalism. Some schools face the challenge of reaching the second stage, the stage of transition. A few schools may be heading towards the final stage, the stage of meaning.

In general, there are three identifiable groups that cut across schools, corresponding to each stage of quality development. Varying stages of development among schools will require differential strategies for quality improvement approaches. These stages and appropriate quality improvement strategies are as follows.

First, the initial stage of development. Schools of the rural-poor students are grouped together as they have many similar characteristics. These schools are for the most part at the initial stage of development heading towards the formalism stage. Schools in this category are the largest in number across Indonesia. They are mostly rural, attended by children from poor families, and are poorly staffed. Most of their teaching staff are graduates of the Primary Teacher Training (SPG) that is now considered to be below minimum credentials. Some of the teachers are undertrained, since they graduated below the SPG level. The teachers are in fact "under-educated" and have only poor knowledge of subjects, lack access to new knowledge and procedures, have received insufficient in-service training, and to a large extent, have access only to obsolete knowledge and skills. The schools concerned may be identified as "disadvantaged," with only less than one-third sufficiently provided with school facilities and classroom equipment, and only 50 percent or less provided with sufficient textbooks. Quality improvement efforts should be aimed, therefore, at providing these schools with textbooks, teaching materials, and adequately prepared teachers.

Second, the stage of formalism. The schools in this category are moving towards the transition stage. These schools are attended by students from rural-wealthier and urban-poorer families. These schools are grouped together and are both identified as mediocre. This school category comprises the second largest numbers of schools. There are more schools in this category than in the previous category (initial stage) which have been provided with appropriate textbooks, school facilities, and

classroom equipment. But the number of these schools that were also poorly provided with materials is also substantial. Most of the schools of this category are staffed with sufficient numbers of teachers, unlike the "initial stage" schools. In terms of educational credentials, the teachers of these schools are mostly undertrained. Only 25 percent are trained at least two years beyond senior secondary education, while the remaining 75 percent are trained below the credential level. The undertrained phenomenon also exists among these teachers and affects the eroding teacher quality. This study shows that there is no significant difference in the comparison of average test scores of teachers between schools of the rural-poor and the urban-wealthier students. This means that the poor quality of teachers appear to be a consistent problem across these two categories of schools. For this school category, provision of textbooks and materials to the needy schools is immediately necessary while other steps are planned to improve teacher quality. In addition, expanding and developing pre-school programs appears to be important for entering children.

Third, the stage of transition. A number of schools may be identified as at the stage of transition heading towards the "meaning" stage. The schools in this category are small in number across the country. They are mostly urban, and attended mostly by students from wealthier families. Most of the schools may be considered "preferred." Most wealthy parents would send their children to these schools, even if they had to pay significant amounts of cash. In effect, these schools enjoy a great deal of additional school revenues which strengthens their fiscal capacity. They are able, therefore, to improve quality through, for example, hiring motivated and committed teachers; providing appropriate textbooks and materials; and making available remedial teaching for needy students. Because they receive this additional funding, the schools are accountable for their success and failure to the parents, who are the purchasers of these services. At this stage, schools can be guided to apply instructional techniques and approaches that develop higher order skills.

The process of quality development can help poorer schools reach the second stage of development, i.e., the stage of transition. This, in turn, will increase the number of schools ready to reach the meaning stage. This study suggests that macro quality improvement policies may be considered relevant only up to reaching the transition stage. In the meaning stage, schools develop by themselves and evolve to strengthen their own management and supervision of instructional quality. The meaning stage is most effective where schools have sufficient sustainable capacity to help students, teachers, and headmasters learn more, while progressing towards sustainability of quality improvement efforts.

BIBLIOGRAPHY

Boediono Dr. (1989) "Perkembangan Ekonomi Pembangunan Jangka Panjang Kedua, 1993-2018". Jakarta, Balitbang-Dikbud.

Bidwell, CE and D.M. Windham (1980) "The Analysis of Educational Productivity, Volume II: Issue in Microanalysis" Cambridge, MA: Balinger Publishing Company.

Fuller, Bruce Dr. (1985) "Raising School Quality in Developing Countries: What Investment Boost Learning? Washington D.C., Education and Human Resources Department, The World Bank.

---------- (1987) "What School Factor Raise Student Achievement in the Third World?" Washington D.C., Education and Human Resources Department, The World Bank.

Heyneman S.P., & W.A. Loxley (1988) "The Effect of Primary School Quality on Academic Achievement Across Twenty-Nine High and Low-Income Countries" American Journal of Sociology Vol. 88., No.6.

---------- & W.A. Loxley (1983) The Distrubution of Primary School Quality within High and Low Income Countries" Comparative Education Review Vol. 27. No. 1.

---------- (1982) "Resources Availability, Equality, and Educational Opportunity Among Nations" In L. Anderson and D.M. Windham (editors) *Education and Development* Lexington, MA: Lexington Books.

---------- & Farrell and Stuardo (1978) "Textbooks and Achievement: What We Know. Staff Working Paper, The World Bank, Washington D.C.

IEES/Balitbang-Dikbud (1986) "Indonesia Education and Human Resources Sector Review: Chapter 5 Pre-primary and Primary Education" Jakarta, MOEC.

Jiyono, Dr. MA. (1987) "Studi Kemampuan Guru IPA di Sekolah Dasar" Jakarta, Balitbang-Dikbud Departemen Pendidikan dan Kebudayaan.

Levin, Henry M. (1980) "Educational Production Theory and Teacher Input" dalam *The Analysis of Educational Productivity, Volume II:Issue in Macroanalysis* oleh Bidwell and Windham., Massachussetts: Balinger Publishing Company.

Mangindaan, Christina Dr. & Elley (1978) "National Assessment of the Indonesian Junior Secondary Schools" Jakarta, BP3K, Departemen P &K.

MOEC (1989) "Educational Management Policy Studies" Executive Summary: Studies 1 to 7. Montreal, Cegir (Canada) Inc.

Moegiadi, Prof. Dr.,(1976) "National Assessment of the Primary School Achievement" Jakarta, BP3K.

---------- (1986) "The determinant of Effective School" Jakarta, Bridges-Balitbang-Dikbud.

Paembonan, Taya (1988) "Proyek Buku Terpadu" Jakarta, dipersiapkan untuk The Study on Human

Paige, Michael (1982) "The Impact of the Classroom Learning Environment on Academic Achievement and Individual Modernity in East Jaya Indonesia" Stanford, Stanford University Doctoral Dissertation.

Postlethwaite T.N. Prof.,Dr & Dr. Keneth Ross (1989)" Basic Education Quality Study: Joint Assignment Report". Jakarta UNDP.

Pusat Informatika, Rangkuman Statistik Sekolah Dasar, Badan Penelitian dan Pengembangan Pendidikan dan Kebudayaan tahun 1975 - 1988.

Selowsky, Marcelo (1980) "pre-school Investment in Human Capital" dalam *The Education Dilemma: Policy Issues for Developing Countries in the 1980's.*, by John Simmons and Torsten Husen (eds), New York: pergamon Press.

Schiefelbein, Ernesto and Joseph Farrell (1982) "Eight Years of Their Lives" Through Schooling to Labour Market in Chile" Ottawa, Canada: IDRC.

Suryadi, Ace (1989) "Studi Mutu Pendidikan Dasar: Status, Variasi, dan Determinan Prestasi Belajar Akademis." Jakarta, Balitbang-Dikbud.

---------- (1986) "Determinants of Differential Mathematics Performance Among Poor-Rural Students in the Indonesian Junior Secondary Schools" Albany, Doctoral Dissertation of the University of New York.

---------- (1982) "Planning, Sampling, and Some Preliminary Results of the Indonesian Repeat 9th Grade Survey" in the International Series of Educational Evaluation, Oxford, Pergamon Press.

----------, A.M. Green, and D.M. Windham (1986) "Teacher Quality as the Determinant of Differential Mathematics Performance Among Poor-Rural Children in Indonesia Junior Secondary Schools" Prepared for the IMTEC Annual Seminar, Bali Indonesia, October, 1986.

---------- (1988) "Model Proyeksi Kebutuhan dan Persediaan Tenaga Kerja Kependidikan Selama Repelita V" Jakarta, Pusat Informatika Balitbang-Dikbud.

---------- (1980) "Penataran dan Kemampuan Mengajar Guru Sekolah Dasar" Laporan Evaluasi Proyek P3D, Jakarta, BP3K Departemen P & K.

---------- and Jiyono (1982) "The Process of Socialization in the Indonesia Primary School in the Indonesia Rural-Agricultural Areas" Presented in the Seminar on Qualitative Research, Bangkok 1982.

Widodo, C.M., (1982) "Studi Putus Sekolah dan Mengulang Kelas di Jawa Barat, Madura, dan Sulawesi Selatan" Jakarta, UNICEF & BP3K Departemen Pendidikan dan Kebudayaan.

World Bank (1986) "The World Bank Annual Report, 1986 " Washington DC.

APPENDIX 1

LIST OF VARIABLES USED IN THE ANALYSES

Table 1

SOCIETAL VARIABLES

Var. Name	Variable Labels	Value/category	Responde nce
1. KATEGORI	Perceived developmental level of community	1. The richest 2. Above average 3. Average 4. Below average	Village leader
2. HASIL1	Avg. family income within census block	(in thousand rupiah)	ditto
3. HASIL2	Avg. family income within village	ditto	ditto
4. NPRISCH	Number of private school institutions	(composite)	ditto
5. PUBFAC	Availability of Public facilities	(composite)	ditto
6. TRANSFAC	Avail.of transportation infrstructure	(composite	ditto
7. SEDIA51	Presence of electricity	1. Yes 2. No	ditto
8. PERCED	Percentage of educated population	(composite)	ditto
5. DAERAH	Geographic location of student family	1. rural areas 2. Cap.of sub-district 3. Cap. of distrc 4. Cap. city-province	household
6. RUMAH	Type of house	1. Temporary 2. Semi-permanent 3. Permanent	ditto
7. TERANG	Lighting conditions at home	1. Lentern 2. Petromak 3. Generator 4. Electricity	ditto
8. FAMGOODS	Possession of modern goods	(Composite)	ditto
9. HASIL	Household income	1. < Rp. 14.999 2. 15.000-29.999 3. 30.000-59.999 4. 60.000-89.999 5. 90.000-119.999 6. 120.000-149.999 7. = >150.000	ditto

STUDENT CHARACTERISTICS

Var. Name	Variable Labels	Value/category	Respondence
1. SEXM	Student sex	1= Boy 2= Girl	student
2. UMURM	Age of student	(in years)	ditto
3. TK	Kindergarten attendance	2=Yes; 1=No	ditto
4. ABSEN	Freq. of absence	1. Never in the last quarter 2. 1-4 times 3. 5-16 times 4. More than 16	ditto
5. LAMBAT	Freq. of tardiness	ditto	ditto
6. TINGKAT	Educ. aspiration wanted to persue study toward	1. Primary school 2. Junior SS 3. Senior SS 4. BA 5. MA 6. Overseas degree	
7. BANTUAN2	Parental learning assistance at home	1. Frequently 2. Sometimes 3. Never	ditto

TEACHER QUALITY VARIABLES

Var. Name	Variable Labels	Value/category	Respondence
1. PROFCAP	Teacher professional capacity	(composite)	teacher test
2. SENIOR	Seniority of teacher	(composite)	teacher quest.
3. STRUCTUR	Structured teaching approach	(see composite)	ditto
4. ADDTEACH	Additional teaching hours	(see composite)	ditto
5. PROFACT	Extended professional activities of teacher	(composite)	ditto
6. BUKU4	Availability of Math. Books for teaching	1. Sufficient 2. Not Sufficient 3. None	ditto
7. BOOKSAVA	Availability of library book s & teaching material	(composite)	Headmaster
8. Teaching effort:			
GUNA1B	Lecturing	1. Tidak 2. Ya	Teacher quest.
GUNA2B	Classroom exercise	ditto	ditto
GUNA3B	Textbooks reading	ditto	ditto
GUNA4B	Reading other books	ditto	ditto
GUNA5B	Classroom discussion	ditto	ditto
GUNA6B	Class. demonstration	ditto	ditto

MANAGEMENT QUALITY VARIABLES

Var. Name	Variable Labels	Value/category	Respondence
9. RKELAS	Number of classroom as measure of school size	ditto	headmaster
10 SCHFAC	Availability of school facilities	(Composite)	ditto
11 CLASSEQ	Sufficiency of classroom equipment	(Composite)	ditto
12 UMUR	Age of principal	(in years)	ditto
13 PENDKS	Ed. Background of principal	1. Primary school 2. Junior SS 3. Primary Teacher Training 4. Senior SS 5. BA (Teacher Tr.) 6. BA (general) 7. Master's degree or higher	ditto
14 LMNGAJAR	Principal teaching experience	(in years)	ditto
15 INTCONT	Internal control mechanism	(see composite)	ditto
16 EXTMGT	External managerial relationships	(see composite)	ditto
17 MEETSUP	Meeting with supervisor (frequency)	(see composite)	ditto
18 BUKMAT6	Sufficiency of Math. textbooks	1. Cukup 2. Tidak cukup 3. Tidak ada	ditto
19 MEETTCH	Freq. meeting with teacher	(see composite)	ditto
20 MEETPRN	Freq. of meeting with student parents	(see composite)	ditto

Table 2

LIST OF COMPOSITE VARIABLES

Var. Name	Variable Labels	Value/category	Respondence
1. NPRISCH	Number of private school institution		Village leader
a. PEND22	Number of private primary schools in this village	Number	ditto
b. PEND32	Number of private Madrasah	Number	ditto
c. PEND42	Number of private Junior Secondary schools	Number	ditto
d. PEND52	Number of private Madrasah Tsanawitah (Islamic JSS)	Number	ditto
e. PEND62	Number of private senior secondary schools	Number	ditto
f. PEND72	Number of private Madrasah Aliyah (Islamic SSS)	Number	ditto
g. PEND82	Number of private Higher Education institutions	Number	ditto
2. PUBFAC	Availability of Public facilities Public Hospital	(Composite)	ditto
a. FAS21	Chemistry	1=No; 2=Yes	
b. FAS61	Public Library	1=No; 2=Yes	
c. FAS71	Sport Facility	1=No; 2=Yes	
d. FAS81	Cinema	1=No; 2=Yes	
e. FAS91	Public markets	1=No; 2=Yes	
f. FAS101	Supermarkets	1=No; 2=Yes	
g. FAS111		1=No; 2=Yes	
3. TRANSFAC	Avail.of transportation infrstructure	(Composite)	ditto
a. SEDIA11	Inter-province road system	1=No; 2=Yes	ditto
b. SEDIA21	Inter-district road system	1=No; 2=Yes	ditto
c. SEDIA31	Inter-sub district road system	1=No; 2=Yes	
4. PERCED	Percentage of educated population	(composite)	ditto
	Number of population who are: uneducated		
a. PENDK1	primary school students		
b. PENDK2	primary school grads.		
c. PENDK3	JSS students		
d. PENDK4	JSS graduates		
e. PENDK5	SSS students		
f. PENDK6	SSS graduates		
g. PENDK7	HE students		
h. PENDK8	HE graduates		
i. PENDK9			
5. F AMGOODS	Possession of modern goods	(Composite)	ditto
a. MILIK1	Radio	1=Yes; 2=No	
b. MILIK2	Tape Recorder	1=Yes; 2=No	
c. MILIK7	Television	1=Yes; 2=No	
d. MILIK8	Refrigerator	1=Yes; 2=No	
e. MILIK 9	Video	1=Yes; 2=No	
f. MILIK9	Computer		
g. MILIK10	Car		

TEACHER QUALITY VARIABLES

Var. Name	Variable Labels	Value/category	Respondence
1. PROFCAP	Teacher professional capacity	(composite)	teacher test
	Teacher's test score on:		
a. SKORMATG	Mathematics	0 – 58	
b. SKORIPAG	Science	0 – 52	
c. SKORINDG	Bahasa Indonesia	0 – 50	
2. SENIOR	Seniority of teacher	(composite)	teacher quest
a. AJAR1	Years of teaching experience in that school	in years	
b. AJAR2	Years of teach. experience in other schools	in years	
c. TATAR4G	Frequency of attending in-service training	times	
d. UMURG	Age of teachers	in years	
e. GAJI1	Salary level	in Rupiahs	
3. STRUCTUR	Structured (routine teaching approach).	(composite)	ditto
	Frequency of making the following activities last year:		
a. GIAT1G	Explain subject contents		
b. GIAT2G	Made lesson plan		
c. GIAT3G	Correcting student works		
d. GIAT4G	Teaching remedy		
e. GIAT13G	Class administration		
4. ADDTEACH	Additional teaching hours	(composite)	ditto
a. KRJLAIN	Other teaching job in other school	1=non teaching 2=teaching	
b. JAM3	Teaching other schools	in hours	
5. PROFACT	Extended professional activities of teacher	(composite)	ditto
a. GIAT5G	Supervise extra-curr.acts	1=never	
b. GIAT6G	Attending inservice tr.	2=1–6 times	
c. GIAT7G	Attend school meeting	3=7–12 times	
d. GIAT8G	Celebrate national days	4=13–45 times	
e. GIAT9G	School recreation	5= 45 times	
f. GIAT10G	Conduct social program		
g. GIAT11G	Conduct school org. acts.		
h. GIAT12G	Involve prof. organization		
i. GIAT14G	Deals with students'parents		
6. BOOKSAVA	Shortage of textbooks and teaching materials	(Composite)	Headmaster
a. LIT1B	Shortage of textbooks	1=Yes	
b. LIT2B	Shortage of materials	2=No	

MANAGEMENT QUALITY VARIABLES

Var. Name	Variable Labels	Value/category	Respondence
1. SCHFAC	Availability of school facilities	(Composite)	ditto
a. FAS2	Teacher room	1=Not avail.	
b. FAS4	Library	1=Not avail.	
c. FAS5	Laboratorium	1=Not avail.	
d. FAS10	Canteen	1=Not avail.	
e. FAS11	Tiolet	1=Not avail.	
2. CLASSEQ	Sufficiency of classroom equipment	(see composite)	ditto
a. SARANA1	Students' desks	1=No avail.	
b. SARANA2	Teacher's deks	2=not sufficient	
c. SARANA3	Black Board	3=sufficient	
d. LENGKAP2	Calculator		
3. INTCONT	Internal control mechanism	(see composite)	
a. GIAT9	Supervise teach. acts.	1=never	
b. GIAT10	Edit lesson prepar.	2=1–6 times	
c. GIAT11	Observe teach. process	3=7–12 times	
d. GIAT12	Guide teachers	4=13–45 times	
		> = 45 times	
4. EXTMGT	External managerial relationships	(see composite)	ditto
a. GIAT1	Plan school activities	1=never	
b. GIAT5	Attend PTA meeting	2=1–6 times	
c. GIAT8	Supervise school act.	3=7–12 times	
d. GIAT19	comparative study with other school	4=13–45 times	
		5= > 45 times	
4. MEETSUP	Freq.of school meet with supervisor on:	(see composite)	ditto
a. RAPAT1	Curriculum issues	1=Never	
b. RAPAT2	Physical plants	2=Sometimes	
c. RAPAT3	Teacher and personnel	3=Frequently	
d. RAPAT4	Budget and finance	4=Always	
e. RAPAT5	Student progr. & problem		
f. RAPAT6	Special activities		
5. MEETTCH	Freq. meeting with teacher	(see composite)	ditto
a. MASALAH1	Curriculum issues	1=Never	
b. MASALAH1	Physical plants	2=Sometimes	
c. MASALAH1	Teacher and personnel	3=Frequently	
d. MASALAH1	Budget and finance	4=Always	
e. MASALAH1	Student progr. & problem		
f. MASALAH1	Special activities		
6. MEETPRN	Freq. of meeting with student parents	(see composite) 1=Never	ditto
a. KONSORT1	Curriculum issues	2=Sometimes	
b. KONSORT2	Physical plants	3=Frequently	
c. KONSORT3	Teacher and personnel	4=Always	
d. KONSORT4	Budget and finance		
e. KONSORT5	Student progr. & problem		
f. KONSORT7	Special activities		